THE physical therapy REVIEW

Some Variations in Therapeutic Exercise Terminology — LAWRENCE

Planned Management for Rehabilitation of the Thoracic Surgical Patient — SHABART, HARMONY, and MOTTA

Therapeutic Mirror — BRDLIK and BAILEY

Exercises for the Disabled Hand: Deaf-Mute Alphabet — AARON

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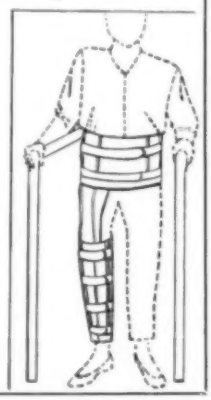

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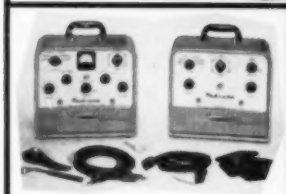

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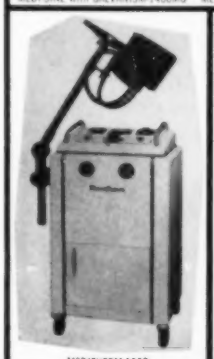

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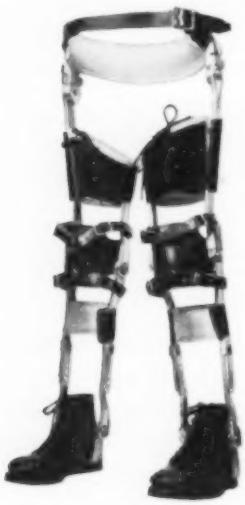

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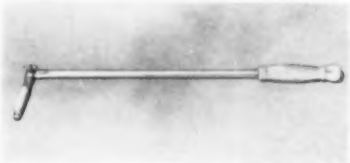

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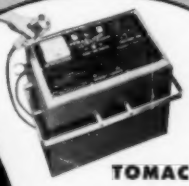

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The Physical Therapy Review

Official Publication of The American Physical Therapy Association

Vol. 36 August 1956 Number 8

Some Variations in Therapeutic Exercise Terminology

Dorothea Lawrence, Major (USAF), (MSpC)

The purpose of this study was to define certain terms used in therapeutic exercise, to clarify the terminology, and to obtain current opinions regarding the concepts of some of the many terms used in physical therapy literature and textbooks. To accomplish this, data was collected by means of a questionnaire from physical therapy schools and from selected representatives in the physical therapy field.

As a preliminary step, a questionnaire was sent to physical therapy directors of the 33 approved schools to obtain a working list of books currently used in the teaching of therapeutic exercise and kinesiology. Twenty-four of the physical therapy directors answered and returned the questionnaires. This working list of books was reviewed for ambiguous or controversial terms and concepts.

It was decided to limit these terms and concepts to the general field of therapeutic exercise and not to explore specialized fields. Terms were selected which seemed to lend themselves to this type of study. Various groupings and forms of questions were used in an attempt to determine currently preferred usage. Terms and concepts selected were formulated into a list to be submitted to a jury or panel.

The Advisory Committee to the Department of Professional Education of the American Physical Therapy Association was asked to help in the study by selecting a number of representative persons in the field of physical therapy to offer opinions on terminology. Each of the six members of the Advisory Committee was asked to suggest four persons to act on the panel which would help to determine the currently preferred usage of terms from the compiled list. From the names submitted, 23 persons were selected to receive questionnaires. All of these had physical therapy training, and three had medical training as well.

From the source material, derived from the survey, a list of terms and concepts was prepared and sent in the form of a questionnaire to the selected representatives; 21 questionnaires were returned. Preferred terms and definitions as selected by the panel were tabulated into a final glossary on the basis of their opinions. The compilation is presented here in the general form that was used in the terminology questionnaire.

Excerpt from "Variations in Therapeutic Exercise Terminology." Thesis submitted to the School of Education, Department of Hygiene, Division of Physical Therapy of Stanford University, 1954.

SECTION I. MOVEMENTS

Joint motion can be satisfactorily described in one of two ways, namely, either with reference to the joint in which the motion takes place or with reference to the part being moved (for example, "elbow flexion," or "forearm flexion"). In relatively simple single joints as the hip, knee, ankle, and elbow the movement is easily understood and no problem arises. Even in the relatively complex multiple-joint area of the wrist there is little difficulty, although more confusion may arise in the foot and shoulder areas regarding precise description of motion.

Since questions have arisen regarding the description of motion by part or joint, this point was considered in the review of the literature. It was found that of all texts reviewed, Gray's *Anatomy of the Human Body*, in its myology section, was the only text that consistently referred to motion in terms of the part. All the other authors used part and joint interchangeably.

In the following section, related items have been grouped for discussion. Returns of the questionnaires have been tallied to indicate preferred terms. Additional terms written in by panel members are marked by an asterisk (*). The tally is followed by pertinent observations from the literature and finally, comments from persons replying to the questionnaire. Some discrepancies in totals of first choices will be noted. In these incidences, the panel members either had no preferred usage or used two like terms interchangeably; examples of this are noted in comments written by panel members following each section.

Upper extremity

Shoulder

1. The upward movement of the humerus in the lateral plane.

Choices	1st	2nd
a. abduction	21	—
b. elevation	—	—
c. sideward elevation	—	1

2. The downward movement to the side in the lateral plane.

Choices	1st	2nd
a. adduction	21	—
b. extension	—	—
c. depression	—	—
d. retraction	—	—

Wells' kinesiology text used the term "extreme abduction," but not "elevation" which is sometimes used to describe movement of abduction from the horizontal position upward.

Stone, who recently revised Bowen's kinesiology text, described adduction as normal depression of the arm and said it is the exact reverse of elevation.

In one of the school syllabi returned with the first questionnaire sent to the approved schools of physical therapy, the following terms were found: "lateral arm raise" (abduction) and "lateral arm swing" (elevation).

3. The upward movement of the humerus in the anteroposterior plane.

Choices	1st	2nd
a. flexion	19	—
b. elevation	—	2
c. forward-elevation	1	—
d. forward-flexion	1	3

4. The downward movement of the humerus in the anteroposterior plane to the side of the body.

Choices	1st	2nd
a. depression	2	—
b. extension	18	—

5. The backward movement of the humerus from the side in the anteroposterior plane.

Choices	1st	2nd
a. extension	5	3
b. hyperextension	16	2
c. retraction	—	—
d. backward swing	—	2

Hollinshead stated that "dorsiflexion" and "hyperextension" are plainly synonymous as they both designate movement in the same direction. Kranz described shoulder motion as follows: "elevation," movement of lifting the humerus to front horizontal position; "depression," the return from front horizontal position; "flexion," the drawing of the humerus from side horizontal to front horizontal position.

Stedman's *Medical Dictionary* gave the terms "hyperextension" and "superextension" as synonymous. The term superextension was not found elsewhere in the literature reviewed.

Wright preferred "retraction" as the term describing the act of bringing the arm to the side from the front (extension), and "hyperextension" as movement backward beyond the side.

Stone did not list hyperextension as one of the motions of the shoulder, but later stated that 45 degrees of hyperextension are possible in this joint.

Neither Morris' nor Gray's anatomy text used the term "hyperextension."

6. The turning or rolling of the anterior surface of the humerus away from the body.

	Choices	1st	2nd
a.	outward rotation	3	9
b.	lateral rotation	6	2
c.	external rotation	12	6
d.	outer rotation	—	—
e.	supination	—	—

7. The turning or rolling of the anterior surface of the humerus toward the body.

	Choices	1st	2nd
a.	medial rotation	6	2
b.	inward rotation	4	7
c.	internal rotation	11	7
d.	pronation	—	—

Many of the authors reviewed used inward, internal, and medial rotation and outward, external, and lateral rotation interchangeably.

The variety of selection by panel members of terms for rotation was more than that for other terms describing movements. On the basis of first choices, most favored were "external" and "internal" rotation, followed by "lateral" and "medial," with "inward" and "outward" least favored although this was a popular second choice. One person designated all three as choices, possibly indicating no preference.

8. The movement of the humerus in a horizontal plane from posterior to anterior.

	Choices	1st	2nd
a.	horizontal adduction	18	1
b.	horizontal flexion adduction	1	1
c.	horizontal swing	2	—
d.	flexion	—	—

9. The movement of the humerus in a horizontal plane from anterior to posterior.

	Choices	1st	2nd
a.	horizontal abduction	18	1
b.	horizontal extension abduction	1	1
c.	horizontal swing backward	2	—
d.	extension	—	—

The two anatomy texts most preferred by the schools—those of Gray and Morris—did not use the terms "horizontal adduction" and "horizontal abduction" to describe shoulder movements.

Wells described the horizontal sideward-backward swing of the arm from forward horizontal position as "horizontal extension abduction" and the opposite as "horizontal flexion-adduction."

Further comments made by panel members on shoulder motions were as follows:

> We make every effort to use strictly anatomical and physiological terminology as used in medical textbooks. A few terms used such as "horizontal abduction and adduction" and "elevation" of the arm we consider necessary to accurately describe the motions.

Regarding the total mechanism of arm movement:

> In the area generally referred to as the "shoulder" there is no single joint and no single moving part. Rightly or wrongly in general usage, the word has a connotation or meaning which is very general in character. One speaks of "round shoulders," the "high shoulder" of the scoliotic, and the "shoulder girdle." Within the area there are several moving parts. There is more than one part which can abduct, elevate, rotate, etc. It thus seems necessary to specify either the joint or the moving part. To refer to "gleno-humeral abduction" would be awkward and inaccurate. Therefore, we prefer the simple and readily understood terminology of "arm" abduction, "arm" flexion, etc., recognizing that such arm movements require participation of other musculature and joints.

Wrist

10. The movement of the back of the hand toward the back of the forearm.

	Choices	1st	2nd
a.	extension	16	2
b.	hand extension	1	—
c.	dorsiflexion	2	6
d.	hyperextension	2	2
e.	flexion	—	—

11. The movement of the palm of the hand toward the front of the forearm.

	Choices	1st	2nd
a.	flexion	19	1
b.	palmar flexion	2	5
c.	hyperextension	—	—
d.	volar flexion	—	2
e.	hand flexion	1	—

Hollinshead used the term "dorsal flexion" as synonymous with "hyperextension" at the wrist. Beevor, Scott, and Gray's anatomy text did not use the term "hyperextension" to describe motion of the wrist.

Six of the panel members indicated they preferred the term "extension" to indicate motion of the hand to the midline, and the term "hyperextension" for motion beyond. One of these added the comment that "this motion actually occurs between the two rows of carpals (transverse midcarpal articulation)."

12. The movement of the hand in which the little finger approaches the ulnar side of the forearm.

	Choices	1st	2nd
a.	adduction	9	1
b.	ulnar flexion	2	1
c.	ulnar abduction	1	1
d.	ulnar adduction	—	1
e.	ulnar deviation	11	6

13. The movement of the hand in which the thumb approaches the radial side of the forearm.

Choices	1st	2nd
a. abduction	9	—
b. radial flexion	2	1
c. radial abduction	1	2
d. radial deviation	11	6

In Morehouse and Cooper's kinesiology text, the following terminology was found: "flexion (dorsiflexion)" and "hyperextension (volar flexion)." Hollinshead used the following terms: radial abduction and ulnar abduction; radial deviation or abduction; ulnar abduction or adduction.

Mackenzie described the movements as radial abduction and ulnar abduction of the hand at the wrist joint. In Morris' anatomy text, abduction of the hand ulnarward and radial abduction were found.

One of the members of the panel pointed out that ulnar and radial deviation are used to prevent confusion when the motions are done in the pronated position of the forearm.

14. The movement of the palm of the hand toward the front of the forearm obliquely in the direction of the ulna.

Choices	1st	2nd
a. flexion with ulnar deviation	16	1
b. ulnar deviation	—	—
c. ulnar flexion	3	1
*d. flexion with adduction	1	—
*e. flexion and adduction	1	—

It was interesting to note that the panel preferred the term "flexion with ulnar deviation" even though it was found in only one textbook reviewed.

Thumb

15. The movement of the thumb away from the index finger in the plane of the palm.

Choices	1st	2nd
a. extension	11	—
b. hyperextension	—	—
c. abduction	7	—
*d. abduction in plane of palm	3	—
*e. radial abduction	1	—

16. The movement of the thumb away from the palm at a right angle to the palm.

Choices	1st	2nd
a. abduction	12	—
b. extension	4	—
*c. abduction at a right angle to the palm	2	—
*d. median abduction	1	—
*e. opposition	1	—

17. The movement of the thumb toward the index finger in the plane of the palm.

Choices	1st	2nd
a. adduction	9	—
b. flexion	10	—
*c. adduction in plane of the palm	2	—

18. The movement of the thumb toward the palm at a right angle to the palm.

Choices	1st	2nd
a. adduction	15	—
b. flexion	4	—
*c. adduction at right angles to plane of palm	2	—
*d. right angle adduction	—	2

Morris' anatomy text used the term "reposition" as the reverse of opposition. This term was not found in any other reference source.

Wells described the movements of the thumb as follows: "movement forward at right angles to the palm" as flexion; abduction as "the lateral movement of the thumb away from the palm"; extension as " the return from flexion to the palm"; hyperextension, " when the thumb crosses the palm." Although this was the most widely used kinesiology text, the majority of questionnaire replies did not follow Wells' description of thumb motion.

Comments written in by panel members on this section were as follows:

> I am presuming these thumb movements are those which occur at the carpometacarpal joint.
>
> Abduction in the plane of the palm is part of circumduction at the first carpometacarpal joint, while abduction at a right angle to the palm is true abduction at the first carpometacarpal joint.
>
> To me, flexion means bending the thumb at the distal or proximal joint or both. Adduction means bringing the thumb toward the index finger indicating motion of the metacarpal regardless of plane. Therefore, I mark both 17 and 18 as adduction. The normal motion is usually about midway between the two planes mentioned.

On the basis of the literature reviewed and questionnaire returns, including the several terms added to the prepared list, it would appear that the description of thumb motions needs further clarification and study.

Lower extremity

Hip

19. The backward movement of the femur in the anteroposterior plane beyond the midline.

Choices	1st	2nd
a. hyperextension	15	2
b. extension	5	1
c. overextension	—	—
d. dorsiflexion	—	—
*e. hyperextension beyond the anatomical position	1	—

Mackenzie described this motion as "further extension (dorsal flexion)" and not as hyperextension.

Scott stated there is no hyperextension at

the hip joint. Stone maintained it is impossible to overextend the hip joint and did not use hyperextension as a term to describe motion of the hip.

As was mentioned previously in relation to the shoulder area, the term hyperextension did not appear in the anatomy texts of Gray or Morris.

One panel member commented that this movement in the hip joint is an exception, not a rule, and if present is termed hyperextension.

20. The inward movement of the femur beyond the midline in the lateral plane.

	Choices	1st	2nd
a.	hyperadduction	1	1
b.	adduction	18	—
*c.	cross adduction	1	—
*d.	adduction beyond anatomical position	1	—

21. The turning or rolling of the anterior surface of the femur away from the body.

	Choices	1st	2nd
a.	external rotation	12	5
b.	lateral rotation	6	2
c.	outward rotation	3	8

22. The turning or rolling of the anterior surface of the femur toward the body.

	Choices	1st	2nd
a.	internal rotation	12	5
b.	medial rotation	6	2
c.	inward rotation	3	8

Only one reference was found which suggested a special term for hip adduction beyond the midline, "hyperadduction" (Wells). Two members of the jury suggested terms in answer to the questionnaire, but apparently there is no generally accepted term in use at present to describe this motion apart from "adduction."

Terms selected to describe hip rotation were similar to those for shoulder rotation discussed previously. As before, "external" and "internal" rotation seem to be the terms of choice.

Trunk

23. The bending of the trunk anteriorly.

	Choices	1st	2nd
a.	bending forward	—	1
b.	flexion	14	—
c.	forward flexion	5	5
*d.	trunk anterior flexion	1	—
*e.	forward bending	—	1
*f.	antiflexion	1	—

24. The bending of the trunk posteriorly.

	Choices	1st	2nd
a.	backward flexion	—	—
b.	backward extension	—	1
c.	extension	14	2
d.	hyperextension	10	1
e.	bending backward	—	2
f.	dorsiflexion	—	1

25. The bending of the trunk laterally.

	Choices	1st	2nd
a.	abduction (right or left)	2	—
b.	lateral flexion	12	5
c.	side flexion (right or left)	1	—
d.	sideward bending	2	2
e.	lateral bending	3	3
*f.	side bending	—	1

Nine persons answering the questionnaire indicated they made a distinction in the areas of the spine for which the terms "extension" and "hyperextension" were used. Six made no such distinction. Several comments were made in this respect, of which two are typical:

> Hyperextension occurs in the cervical and lumbar regions but not in the thoracic region. I prefer "extension" as meaning the return from flexion and "hyperextension" as the posterior movement in the anteroposterior plane.

> Extension refers to action in the dorsal spine from a flexed position to an erect position; hyperextension is movement of the lumbar spine beyond the normal extended (neutral or anatomical) position.

One comment was as follows:

> "Extension" may be used for the entire range or for posterior movement from the flexed position to the anatomical position; "hyperextension" designates motion to the full range of extension.

SECTION II. MISCELLANEOUS TERMINOLOGY

The method of presenting material in this section is similar to that which has been followed in Section I.

Miscellaneous Terminology—A

1. Movement in which the object moves as a whole and all its parts move the same distance in the same direction.

	Choices	1st	2nd
a.	rectilinear motion	1	—
b.	translatory motion	4	1
c.	linear motion	11	1

2. Movement of an object around an axis.

	Choices	1st	2nd
a.	angular motion	2	—
b.	rotatory motion	8	1
c.	rotary motion	10	3
d.	axial motion	2	1

In discussing mechanical principles of motion, several authors gave more than one of the terms listed above. For example, Stone defined "rectilinear or translatory" motion, and "angular or rotatory." Scott stated that linear and translatory, and angular and rotatory motion are synonymous. Wells' definition pertains to "angular or rotatory or axial" motion.

Definitions of terms in this portion of the questionnaire were selected from one or more of the sources reviewed wherever possible.

Five persons returning questionnaires failed to answer the first item in this section, although all answered the second.

One person commented that "angular motion" is used for movements in which one end of the moving part travels through a greater distance in space than the other end, while "axial motion" is used when both ends of the moving part travel about the same distance in space.

3. The ability of the muscle to surrender contraction or the surrendering of contraction.

Choices	1st	2nd
a. de-contraction	1	2
b. physiological elasticity	—	1
c. muscle elasticity	—	1
d. relaxation	19	1

Review of the literature revealed that the terms listed above which were not selected by the jury are not in general use. They are defined by Kraus as follows:

> .....physiological elasticity (de-contraction)
> .....means the ability of the muscle to surrender contraction . . . to "de-contract," to relax.
> Muscle elasticity is the ability to relax or de-contract.

4. Contraction of a muscle during which the muscle actually lengthens.

Choices	1st	2nd
a. lengthening contraction	5	6
b. eccentric contraction	16	2

5. Contraction of a muscle during which the muscle is unable to shorten and remains at its original length.

Choices	1st	2nd
a. isometric contraction	11	6
b. static contraction	10	1
c. tonic contraction	—	—
d. postural contraction	—	—
*e. muscle setting	—	1

6. Contraction of a muscle accompanied by a shortening in the length of the muscle.

Choices	1st	2nd
a. isotonic contraction	6	3
b. concentric contraction	10	5
c. phasic contraction	—	1
d. kinetic contraction	—	—
e. shortening contraction	4	1

Again the less popular choices of the above items were used very little in the literature reviewed. Ewerhardt and Riddle stated that "kinetic" or "phasic" contraction produces motion of a segment; if the muscles remain contracted to hold the segment stationary, the contraction is "postural" or "static." Stone spoke of "isotonic, concentric, or phasic" contractions. Wells also indicated that "concentric" and "phasic" are synonyms.

One of the persons returning a questionnaire pointed out that the terms "isometric" and "isotonic" contraction are used in physiology, while "static" contraction is an anatomical, or kinesiological term.

Five persons chose "isometric" and "isotonic" contraction as terms of choice for items 5 and 6. Four of those chose "eccentric" in item 4, while the other preferred "lengthening" contraction. Six persons selected "eccentric," "static," and "concentric" contraction for these items.

Additional terms for movements were suggested by one person:

Acceleration (concentric contraction)

Zero acceleration (a hold position, isometric contraction)

Negative acceleration (or deceleration) (eccentric contraction)

For example:

> *Elbow flexion acceleration*, movement is elbow flexion and most active muscles are elbow flexors, contracting concentrically,
>
> *Elbow flexion deceleration*, movement is elbow flexion but most active muscles are the elbow extensors, contracting eccentrically,
>
> *Elbow extension deceleration*, movement is elbow extension but the most active muscles are the elbow flexors, contracting.

7. Intermittent voluntary contraction and relaxation of muscles without joint motion.

Choices	1st	2nd
a. muscle setting	12	3
b. static contractions	8	4
c. holding exercises	—	—
d. tensing exercises	—	2
*e. setting and relaxing	1	—
*f. isometric muscle setting	—	1
*g. isometric contraction and relaxation	1	—

One panel member indicated that "muscle setting" is a clinical term while "static" contractions refers to anatomical (kinesiological) usage.

8. A muscle which is directly responsible for effecting a movement.

Choices	1st	2nd
a. mover	—	—
b. prime mover	19	—
c. protagonist	—	3
d. agonist	2	7

9. A muscle acting with the muscle which is directly responsible for the movement and which aids in the movement.

Choices	1st	2nd
a. assistant mover	6	—
b. emergency muscle	—	—
c. accessory muscle	10	2
*d. synergist	3	—

10. A muscle acting to provide a stable basis for the movement or to hold the part in the appropriate position for the desired action.

Choices	1st	2nd
a. fixator	5	8
b. stabilizer	16	2
c. supporting muscle	—	—

11. A muscle acting to prevent an undesired action of the muscle which is directly responsible for the movement.

Choices	1st	2nd
a. synergist	16	1
b. neutralizer	4	—

Most of the discussion of these items centered around the concept of synergistic action. Wells has suggested use of the term "neutralizer" to replace "synergist" in order to avoid confusion. In the most recent edition of Bowen's kinesiology text, Stone has also abandoned the term synergist in favor of neutralizer.

One panel member wrote:

> Apparently Wells does not like the term "synergist" and has advocated the term "neutralizer" to avoid confusion. However, it is my impression that Wells' term "neutralizer" has not been generally accepted.

Questionnaire returns would bear this out, as 14 persons selected "synergist" and only 3 "neutralizer" in item 11.

Two persons indicated they would use "synergist" to fit the description in item 9. One person stated the term "synergist" is used as an overall heading, and types of synergists, such as accessory muscles and stabilizers, are then distinguished.

Regarding item 11, one person wrote:

> Actually there may be some question as to whether there is need for this term (neutralizer). Fundamentally the action is stabilization, though we use the term "stabilizer" to mean the muscle which fixes or stabilizes the origin of the prime mover, and the term "neutralizer" to mean the muscle which prevents undesirable motion at the joint or in the undesired direction.

With regard to item 8 through 11, two persons indicated that assigning a specific role to muscles taking part in a movement is questionable. Comments were:

> (In relation to "prime mover") I have not been able to find one "directly responsible" (technically).

This person indicated these terms were to be avoided.

A second comment was:

> To some extent it is possible to say which muscles are active in a particular movement but to assign a specific role to each seems to me to be going beyond our information.

Regarding item 11, this panel member added the term "synergist" is interesting to think about and to discuss, but it is doubtful that much can be gained by trying to be specific in the issue.

Questionnaire returns and literature review indicate this is another area needing further investigation, particularly as to use of the term "synergist."

12. A plane passing through the body from front to back dividing it into right and left symmetrical halves.

Choices	1st	2nd
a. vertical (plane)	—	2
b. sagittal	13	1
c. anteroposterior	4	4
d. cardinal sagittal	—	—
e. median sagittal	—	1
*f. midsagittal	1	1
*g. median	2	—

13. A plane passing through the body from side to side dividing it into equal anterior and posterior halves.

Choices	1st	2nd
a. frontal (plane)	13	2
b. coronal	5	4
c. lateral	3	1

14. A plane dividing the body into upper and lower halves.

Choices	1st	2nd
a. horizontal (plane)	8	3
b. transverse	13	2

The terms of choice of panel members were "sagittal," "frontal," and "transverse."

The definition for item 12 was taken from Steindler who mentioned right and left symmetrical halves divided by the "cardinal sagittal" plane. He added: "Because of this symmetry the plane must contain the center as well as the line of gravity." One of the panel members stated that right and left halves are never symmetrical but agreed that the plane passes through the center of gravity or weight line.

Discussion here also centered around use of the term "equal" in item 13 (from Stone). One person said:

> We do not use "frontal" in reference to *equal* anterior and posterior halves. That would have to be a coined word I suppose of "midfrontal."

Another suggested "midfrontal," "median frontal," or "transverse vertical" for item 13. Steindler, spoke of the "cardinal frontal" plane.

It was also pointed out on one questionnaire returned that in item 14 "horizontal" plane applies to the anatomical position, while "transverse" (second choice in this instance) refers to any position.

Miscellaneous Terminology—B

In this section a number of definitions of certain terms were selected from the literature and panel members were asked to make a choice of the one most nearly expressing their own understanding of the term. When definitions found were considered to be essentially duplicates, one representative definition was placed in the list. In two instances, write-in definitions were given in preference to any of the definitions from the literature.

1. Synergist

	Number
a. muscle which contracts at the same time as the prime mover in order to facilitate or potentiate the effect of the prime mover	5
b. muscle which cooperates with another muscle or group of muscles to produce a movement	7
c. muscle which supplements the action of the prime mover	1
d. muscle which comes into play to inhibit any secondary unwanted movement of the prime mover	5
e. muscle which works or relaxes to modify the action of the prime mover	2
*f. muscle which contracts to rule out undesired action. Divided into (a) helping synergist and (b) true synergist	1
*g. any muscle acting together with the prime mover to produce a movement	1

Items b and c were each selected once as a second choice. The concensus here seemed to be that the term "synergist" applies to a general cooperation of muscles. A minority suggested the term refers to a more specific function of modifying or inhibiting the action of the prime mover. However, no one definition appeared to be satisfactory to a majority of those answering the questionnaire.

2. Contracture

	Number
a. a state of prolonged contraction of muscle which persists even after the stimuli ceases	1
b. a shortening or distortion which may be permanent as from shrinkage of muscle or scars, or spasmodic shortening from a sudden stimulus	6
c. a maintained state of retarded relaxation	—
d. reduced length permanently assumed by a muscle kept in a shortened position for a long period of time.	5
e. a condition in which the muscle cannot be made to assume its normal length	4
f. a permanent state of tension and range of the muscle differing from the physiological state	—
g. a shortening due to pathological conditions	2
h. type of contraction that is not accompanied by an action potential	1
*i. a fixed shortness of soft tissue unrelated to tension or contraction	1
*j. a state of shortening of muscle due to pathological changes within the muscle which may or may not be reversible	1

Items c and d were each selected once as a second choice. The above definitions from the literature showed a diversity of opinion. Returns from the questionnaires indicated this was shared by panel members.

The general confusion was reflected in comments received:

> Item b combines both the orthopedic and physiological definition. Item c would be the best definition from a physiological standpoint.
>
> It seems inevitable that we are going to have to change our terminology or the physiologists will need to change theirs, as we are talking about two different conditions.

SECTION III. THERAPEUTIC EXERCISE TERMS

Terminology relating to names used to designate various therapeutic exercise procedures was investigated. This has given rise to confusion in clinical situations when orders for treatment are not always interpreted in the same way by persons dealing with the patient.

In the literature many terms were found for a variety of procedures. For example, one author subdivided assistance for exercise and stretching into self-assisted, gravity-assisted, and apparatus-assisted. Passive movement was relaxed, forced, or by manipulation. "Elasticity developing" exercises included reflex relaxation, assisted stretching, and active and passive stretching.

It was finally decided to approach this section by attempting to define as clearly as possible the basic procedures discussed and ask the panel to suggest the best term for each.

Therapeutic Exercise Terms

1. Any exercise in which the contraction of the subject's muscles produces the motion entirely or in part.

	Number
active exercise	15
active motion	1
voluntary	1
active exercise, assistive or resistive	1
active assistive	1

A comment was made on this item that no single term describes this without further qualification.

2. Exercise in which the contraction of the subject's muscles accomplishes the movement without the aid or opposition of any external force.

	Number
active exercise	9
active free	5
free active exercise	1
active motion	1
free exercise	2
active voluntary free	1
active, gravity eliminated	1

One reply suggested active (free) exercise "provided gravity is not considered an external force." Another commented that the statement implies gravity is eliminated, whereas item 1 does not carry that implication.

3. Exercise in which the force produced by contraction of the subject's muscles is supplemented by some external force.

	Number
active assistive exercise	9
assistive active exercise	5
assistive exercise	5
active exercise with various degrees of assistance	1

The person suggesting "active exercise with various degrees of assistance" stated that the term "active assistive" is misleading, and also that items 2 and 3 of the questionnaire should be revised although no suggestions were made for their rewording.

4. Exercise in which contraction of the subject's muscles is opposed by some external force.

	Number
resistive exercise	13
active resistive exercise	7
resistive active exercise	1

5. A movement within the free range of motion which is produced entirely by an external force, without active contraction of the subject's muscles.

	Number
passive exercise	16
passive motion	3
passive range of motion	1
passive movement	1
relaxed	1

In relation to this item one person giving "passive exercise" as the term of choice stated: "Effort on the part of the patient to produce motion regardless of the amount of participation achieved, perceptible or imperceptible, would make this active exercise." Another pointed out that this should be called passive *movement* rather than exercise.

6. Movement in which the subject's muscles or other soft tissues are elongated beyond their free range by the application of an external force, without active contraction of the subject's muscles.

	Number
passive stretch	14
stretch	4
forced	3
forced passive exercise	1
stretching (forced motion)	1
passive exercises	1
stretch reflex	1

A comment here was: "The term mobilization may also be used, as 'hamstring mobilization' or 'back mobilization.'"

7. A movement in which the subject's muscles are elongated beyond their free range by the active contraction of the subject's own muscles.

	Number
active stretch	17
stretch	1
hypermobility exercise	1
active mobilization	1
self-mobilization	1
active exercise through maximum range	1

8. A movement in which the subject's muscles are elongated beyond their free range by the contraction of the subject's own muscles, supplemented by an external force.

	Number
active assistive stretch	9
assistive active stretch	3
active stretch	1
active with stretch	1
stretching	1
active forced	1
forced movement	1
assistive hypermobility exercise	1
progressive resistive	1

One panel member stated that no special term is needed for the situation in item 8; movement involves active stretching with the therapist adding a passive stretch. Another wrote:

> This is a dubious procedure. If the patient is weak he will cease at the point of assistance. If he has pain or fear he will also cease. I doubt if they ever really work together—one may follow the other.

9. A forced movement performed by a physician, often with the use of local or general anesthesia.

	Number
manipulation	16
manual manipulation	1
passive manipulation	1
passive forcing	1
stretch with or without anesthesia	1

Replies in this section indicated a good deal of basic agreement, although there were minor variations in wording.

SECTION IV. ADDITIONAL TERMS

Terms selected for this section were found in reference material used by the schools. The terms appeared very rarely or only once in the literature reviewed. Panel members were asked whether or not they ordinarily used the following terms:

	Yes	*No*
1. Outer, middle, and inner range of joint movement	4	16
2. Eccentric, isometric, and concentric relaxation	5	16
3. Pure and helping synergists	2	16
4. Hyperadduction		
a. hip	—	18
b. thumb	—	18
c. shoulder	—	18
5. Reposition (thumb)	3	16
6. Depression of the arm, to mean		
a. motion downward from horizontal	2	16
b. motion downward from overhead	—	18
7. Elevation of the arm, to mean		
a. motion upward through the full range	2	16
b. motion upward from horizontal	4	15
Do you use the terms "elevation" and "depression" in a general sense indicating no particular plane or range of motion?	4	16

Comments were as follows:

Item 1 and 2: Use occasionally for teaching purposes for physical therapists but not clinically with patients, nurses, or others.

Item 3: Use *true* and helping synergists.

Item 4: This seems to be an appropriate term at the hip only. At the glenohumeral joint, adduction must be combined with flexion or extension to be done beyond the anatomical position. At the carpometacarpal joint of the thumb it seems necessary.

Item 5: Do not use this term but if it means the opposite of opposition it is a good term.

Item 7: "Elevation" of the arm is used to include both flexion and abduction. In describing accompanying movements it facilitates understanding since they have a lot in common. "Depression" is not used as a rule, although the inconsistency is recognized; "lowering" is used instead as the opposite of elevation or lifting.

I reserve "elevation" and "depression" for coronal plane movements at the sternoclavicular and acromioclavicular joints. It would be convenient to have terms to apply to the movements that combine glenohumeral flexion with upward rotation of the glenoid fossa (sternoclavicular and acromioclavicular) and those that combine glenohumeral abduction with upward rotation of the glenoid fossa.

Regarding item 7, four persons mentioned the use of "elevation" and "depression" not of the arm but of the shoulder girdle or scapula.

It was apparent that a great amount of care and thought was exercised by the members of the panel in answering the questionnaire. This was evidenced by frequent and extensive comments.

Analysis of questionnaire data showed that often a first choice of terms was clearly indicated. In a few instances two or more terms in reference literature tended to parallel choices by the panel members; that is, terms most often selected were the same as those in common usage in many texts. Terms used by only one or very few authors were not generally selected by the panel.

In the shoulder area, any one term for rotation was not clearly preferred, although on the basis of first choices "external" and "internal" led over "lateral" and "medial" in a ratio of about 2:1. It was interesting that "horizontal abduction" and "horizontal adduction" were selected by nearly everyone even though these terms do not appear in the major anatomical texts. The same was true for "hyperextension." Item 7 in Section IV indicated that "elevation" and "depression" in relation to motion in the shoulder area are not in general use.

The wrist section showed agreement on the terms and concepts of "flexion" and "extension." It was interesting here that "ulnar deviation" and "radial deviation" were selected by more persons than "abduction" and "adduction" for the wrist, although the latter appeared more frequently in texts reviewed. "Flexion with ulnar deviation" was selected by sixteen persons to describe oblique movement of the hand toward the forearm even though this appeared very rarely in the literature.

Terminology describing motions of the thumb was found to be that most in need of clarification. There were more additional terms and comments written in by panel members in this section than in any other in the questionnaire. In the case of one concept, movement of the thumb toward the index finger in the plane of the palm, the motion was termed "flexion" by ten persons and "adduction" by nine. This may be related to the fact that Wells' widely-used kinesiology text, which differs from many other texts on this point, terms this movement adduction rather than flexion. The same confusion existed for the terms "extension" and "adduction." It is easy to see how this could lead to difficulties in clinical application of exercise and muscle testing.

In the section relating to hip motion, the same variation in rotation terminology was found as in the case of the shoulder. "Hyper-

extension" was accepted here as was true in the shoulder area, although the presence of free backward movement beyond the midline was questioned by one person. No special term was used for adduction beyond the midline.

Trunk "flexion" and "lateral flexion" were selected by the majority. In relation to posterior motion, seventeen persons used both "hyperextension" and "extension" and of these, nine indicated that they made a distinction in the areas in the spine for which these terms were used. The remaining eight made no such distinction.

In the miscellaneous section of the questionnaire, "linear" motion was selected over "translatory" and "rectilinear," and either "rotary" or "rotatory" over "axial" or "angular." Most popular terms for types of muscular contraction were "eccentric," "isometric" and "concentric," although "static" and "isotonic" were also frequently chosen. There appeared to be no definite preference here.

Four categories of muscles in normal movement were selected as: "prime mover," "accessory muscle," "stabilizer" and "synergist." Although the latter was chosen at this point as the best term to indicate a muscle acting to prevent an undesired action of the prime mover, in Section III, calling for a definition of a synergist, the majority agreed that a synergist simply cooperates with another muscle to produce a movement. Only five persons specified that it inhibits a secondary, unwanted movement of the prime mover. Thus it would appear that the term is most often used in the broad sense.

There was wide lack of agreement in selection of a definition for the term "contracture." This was another point indicating a particular need for analysis and clarification of use of the term.

Terms of choice for planes were "sagittal," "frontal," and "transverse."

In the terminology suggested by panel members to describe various types of exercise, there was basic agreement although there were some variations in wording. Here it was again true that terms appearing infrequently in the literature have not found acceptance among panel members.

CONCLUSION

The result of this study indicates a definite need for a more complete analysis of terms used in physical therapy.

Even though the terms and the concepts of terms considered in this study are commonly used in therapeutic exercise and kinesiology, the tabulation of the choices made by the panel members indicates there are still some differences of opinion in regard to the terminology. It was felt that personal interviews with the panel would have further clarified their interpretation of the item.

It is hoped the final glossary will provide a basis for some clarification in the limited number of terms selected for this study as well as a guide for further more extensive study.

References to texts and sources of concepts and terms have been omitted but are available in the original thesis.

Dues Notice

Annual dues were payable on May 1st. Your prompt response will be appreciated. The Bylaws require that members whose dues have not been received by August 1st shall be suspended from membership. If you did not receive a bill please do not wait to receive our follow-up notice.

May we also call to your attention that according to the Bylaws only those members not actively engaged in the practice of physical therapy are eligible for inactive membership. Such members may transfer to inactive membership by applying to the Board of Directors.

Planned Management for Rehabilitation of the Thoracic Surgical Patient

Elmer J. Shabart, M.D., Wilma-Nell Harmony, B.S., and Earl C. Motta, M.A.

The literature on thoracic surgery and rehabilitation is plenteous both here and abroad. To attempt any kind of a review of this literature, however, would be of no special merit to this paper. It is interesting to observe that there appears to have been a considerable increase in definitive thoracic surgery during the last five years but there has been a noticeable disregard, at least no mention has been made, of an adjunctive program of rehabilitation. We are fully cognizant that in many facilities financial considerations limit the feasibility of employing a staff to carry on rehabilitation services. But, we believe that the ancillary services of physical and occupational therapy can offer the thoracic surgical patient the opportunity to minimize deformity and to regain functional ability. Certain principles opportunely applied by the surgeon, the "key man" in this specific rehabilitation, can be utilized in order to return the patient more quickly to a normal way of life. Our purpose, therefore, is to present a formulated plan, combining the services of the surgeon, nurse, physical therapist, and occupational therapist, which is functioning successfully at the Veterans Administration Hospital, Livermore, California. Also, we wish to interest the thoracic surgeon in the adoption of a plan for the patient in order to achieve his total rehabilitation.

The procedure of rehabilitation is initiated by the surgeon, who is the one person who controls or serves to coordinate the entire management of the patient and from whom and around whom the well planned program revolves and progresses. This program begins at the point of the patient's acceptance of the suggested thoracic, surgical procedure. The "team approach" as discussed in an editorial in the *Physical Therapy Review*, Volume 35, Number 3, March 1955, is our method of attack. The surgeon, the nurse, the physical therapist, and the occupational therapist are members of the cooperative, well integrated, functioning group. The surgeon directs and organizes the surgical details, but it is the responsibility of each specialist to meet the needs of the patient as the occasion arises.

The integrated plan is divided roughly into two obvious stages, the preoperative and the postoperative phases. In preoperative planning the patient is invited to a conference with the 'team', to which each member contributes by orienting the patient to the member's particular specialty. At this conference the patient is helped to understand how each member's contribution fits into the whole scheme of his eventual rehabilitation. The team keeps in mind not only the specific surgery and its disabling propensities, but also the ultimate ability of the patient to function as nearly like a normal person as possible. The extent of normalcy is determined by the physical therapist in the preoperative orientation. The generally accepted methods of goniometric measurement are used, postural evaluation is done, and photographs are made. The patient is instructed in coughing and segmental breathing technics. This paper does not intend to bring out anything particularly new and startling in treatment, for the essential technics of therapeutic exercises for the thoracic surgical patient have been discussed in full detail in papers by Linduff, Treister, Harmony, et al. Preoperatively, the occupational therapist supplies a tonic or diversional type occupational therapy based on activity commensurate with the patient's allowable activity routine. The patient learns that following his physical therapy regime kinetic occupational therapy adapted to his measured ability, aptitude, and interest will proceed without detour to his day of departure from the hospital.

The postoperative phase begins on the first postoperative day, just 24 hours following surgery, when the physical therapist visits the patient on the surgical ward and assists him to

Elmer J. Shabart, M.D., F.A.C.S., Chief, Surgical Services; Wilma-Nell Harmony, Chief, Physical Therapy; Earl C. Motta, Occupational Therapist; Veterans Administration Hospital, Livermore, California.

move shoulders and arms as far as tubes, bandages, and pain will allow. The occupational therapist accompanies the physical therapist in order to begin development of good rapport and to explain again the function of occupational therapy which is to be instituted later. The nurse and attendant are coached to observe and remind the patient to maintain proper bed position at all times. Placement of the bedside table and call button are arranged to force the patient to use the arm on the operated side. Pressure technic for coughing and segmental breathing as taught by the physical therapist are a part of the continuous program which the nurse and attendant also manage. Each successive day a progressive series of exercises is developed, until the intermediate stage is reached. The patient then returns to his original ward and subsequently reports to the physical therapy exercise room for active-assistive and active exercises, which are graduated in an ever-increasing and advancing program to meet the patient's need.

When the patient is two to four months postoperative, depending upon the rate of recovery and progress, his physical status and clinical picture are reviewed by a physical therapy board. (This has been termed a "Physical Therapy Board" because it is called to order by the chief physical therapist, who presents those patients who have successfully recovered normal posture and functional use of their arms.) The conference is attended by the surgeon, the physician in charge of the patient, the acting-chief and the executive assistant of the Physical Medicine and Rehabilitation Service, the occupational therapist assigned to the surgical ward, the physical therapist concerned, and any other hospital personnel interested in the patient's welfare. The patient is presented to this board and is given the opportunity to view his preoperative and postoperative roentgenograms of the chest and spine which are explained to him. His progress both clinically and physically is reviewed for him, questions are invited, and his rehabilitation program is outlined for him up to the proposed date of his departure from the hospital.

The patient now understands that occupational therapy is the next phase in his planned rehabilitation. This clinic is conveniently located on the recovery ward of the surgical section. The patient begins a program designed to maintain postural gains and to further develop his range of motion and endurance through coordinated, functional, meaningful activity. This includes a variety of occupationally adapted activities such as cord knotting, weaving, ceramics, plastics, printing, and recreational activities of dart throwing, ring toss, and yoyo spinning. The importance of the patient's activity now lies in a realization of achievement, in regaining self-confidence and, in general, reconditioning for normal living and earning capacity. Occupational therapy provides the means whereby the patient may change from his rest habits with minimal activity to a more active, self-dependent way of hospital participation.

In conclusion, we should like to reiterate that we are aware that every hospital is not so fortunate as to maintain a staff of therapists who can participate in a plan such as we have described. At the same time we should like to stress that such an elaborate plan is not essential to the rehabilitation of the patient who has undergone thoracic surgery. But, we would like to emphasize that the thoracic surgeon must be conscious of the benefits of any plan, great or small, in order to carry out successful rehabilitation of the patient. We feel that initiation of rehabilitation procedures in a late postoperative phase when patient attitudes, limitation of motion, or detrimental postural effects have become firmly entrenched is too late. The surgeon knows that certain deformities can be prevented by a little forethought and attention to the patient. He must, therefore, have a plan of rehabilitation which must be instituted prior to surgery, and he must follow through in the postoperative stage. We grant that it takes a little more of the time of the busy surgeon to establish and carry out a purposeful plan, but it has been our experience that the end results certainly justify the sacrifice of time. In a paper such as this we do not feel it is feasible to outline a plan for the thoracic surgeon who does not have access to a Physical Medicine and Rehabilitation Service; that, primarily, has not been the purpose of this paper. However, if we can make the thoracic surgeon more cognizant of physical rehabilitation benefits, and if we can encourage him to develop a plan of management suitable to his own busy way of life, incorporating the use of his available resources, then this paper will have served its purpose.

SUMMARY

Planned management including preoperative orientation and purposeful postoperative activity is essential to the total rehabilitation of

the patient who undergoes thoracic surgery. This can be achieved either by a team of specialists or by careful planning of the thoracic surgeon who uses his available resources. Physical therapy assists in restoring the patient to his maximal physical capacity. Occupational therapy provides the transition from rest habits to functional activity.

Suggestions from the Field

Therapeutic Mirror

Joseph A. Brdlik and James A. Bailey

For a long time posture mirrors have been necessary items in physical therapy departments, especially in those which deal largely with lateral postural deviations commonly found in balance and ambulation training of hemiplegic patients, lower extremity amputees, and some of the cerebral palsied.

Different physical therapy departments are equipped with a variety of mirrors. Some are tilting; some are triple or hinged; and many are too small. If this equipment does not fulfill all criteria, it can confuse or deceive the patient and the physical therapist and retard the patient's progress. Often, especially in equipping a new department, a posture mirror is ordered which proves, in the treatment situation, to be either too large or too small; the material is inferior, or the structure is not stable. Accordingly, from our experience we have found that a posture mirror should meet the following specifications in order to render satisfactory service.

1. It should be rigid and mounted at exactly right angles to the floor, never tilting to confuse the patients.
2. It should be a single panel mirror. Triple or hinged mirrors may be confusing to a normal person and certainly more so to the cerebral palsied patient because of his confused sense of perception and low level of attention.
3. The size of the mirror can be calculated by applying the basic physical principle that incident and reflected light rays make equal angles with the normal, which is an imaginary line perpendicular to the surface of the mirror at the point of incidence.

Joseph A. Brdlik, Chief Physical Therapist, the Rehabilitation Center of Summit County Inc., Akron, Ohio; James A. Bailey, Technical Consultant to the Rehabilitation Center of Summit County, Inc., Akron.

In a mirror mounted vertically the normals will always be horizontal. In order to see a certain part of the body, a light ray incident from this body part has to reflect into the eye; thus the normal of this ray will divide the vertical distance from the eye to this given part into two equal parts. This axis will not change its position if the subject is moved closer to or further away from the mirror, providing that the lateral position of the mirror is unchanged (Fig. 1).

To establish the vertical dimensions, the following formula may be used:

a = subject's body height
b = vertical distance from top of head to eye level
A^1 = top level of mirror
A^2 = bottom level of mirror

It will be found that, utilizing these values, the following is true:

$$A^1 = a - \frac{b}{2}$$

$$A^2 = a - \frac{b}{2}$$

These values increase or decrease with increasing or decreasing body height, but are not subject to change due to different distances of the subject from the mirror. In practical calculations, for A^1 we use the height of the tallest patient in the department and for A^2 the height of the smallest one.

Example: If the tallest patient is 6′4″ and the distance "b" in his case is 4″, the necessary mirror height for this patient would be 6′2″.

$$6'4'' - \frac{4''}{2} = 6'2''.$$

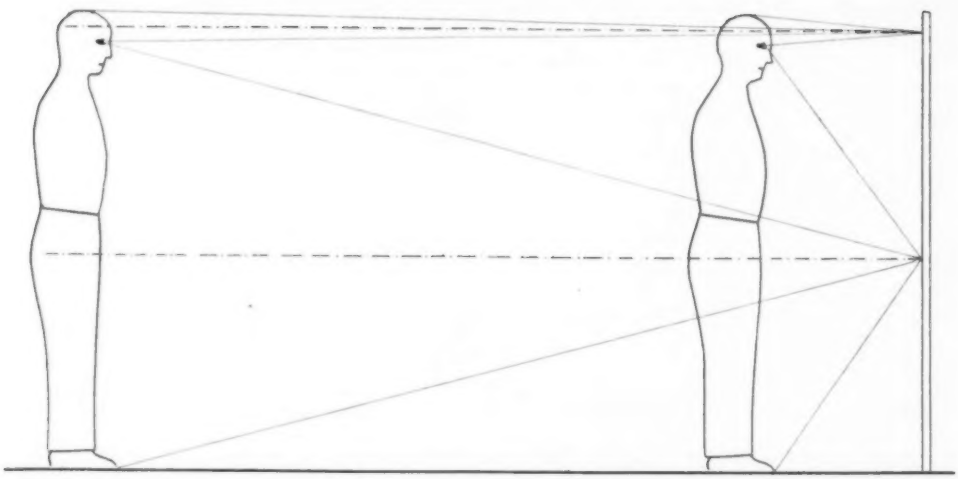


Figure 1. Direction of light ray incident divides vertical distance from the eye to a given part equally.

The maximal lowest point of the mirror for this patient (A^2) would be 3′.

$$\frac{6'4'' - 4''}{2} = 3'.$$

If the shortest patient in the department is a child 3′ tall, with distance "b" of 3″, the necessary mirror height (A^1) would be 2′10½″.

$$3' - \frac{3''}{2} = 2'10\tfrac{1}{2}''.$$

The lowest point (A^2) would be 1′4½″.

$$\frac{3' - 3''}{2} = 1'4\tfrac{1}{2}''.$$

To meet the needs of both patients with one mirror it would be necessary to order an effective mirror surface 57½″ high, mounted on a base 16½″ above the floor level, thus bringing the top of the mirror to the desired height of 6′2″.

If we consider the width of the mirror we find that a patient standing directly in front of the mirror and perfectly aligned in the sagittal plane needs a mirror one half times as wide as the maximal width of his body, including his arms. For every inch of lateral deviation we add an inch to the width of the mirror.

Example: A patient with a body width of 24″, standing straight, will need a mirror 12″ wide in order to see himself. A mirror 24″ wide will allow him to deviate 6″ from the plumbline to either side and still see both his arms. These figures do not vary with distance either.

4. Unless the mirror is of high quality it may cause a distorted reflection. The mounting of the mirror should be selected with care.
   a. The framewood must be thoroughly seasoned and of nonwarping quality.
   b. The same is true of the backing. A material which warps will pull the glass with it, and distort the reflection. A compounded product such as pressed wood or pressed paper should be considered.
   c. The base mounting should be heavy and have a good stand. The heavier it is the less possibility there is of upsetting its balance.

With a moveable mirror the casters should be no less than 2″ in diameter and of a heavy duty ball-bearing type so that they will roll easily under a weight of 100 to 150 lbs. Experience has shown that a mirror base loses its stability in relation to width if the casters are placed closer together than the glass width. For ex-

ample, with the 24″ by 6′2″ mirror described caster spacing should be no less than 18″ by 28″. It must be remembered that these measurements are taken when the casters are facing each other and thus represent the actual minimum figure.

SUMMARY

Therapeutic equipment should accomplish the purpose for which it is purchased. Scientifically designed equipment affords the best treatment. Therefore, criteria have been given for the selection of a posture mirror.

Suggestions from the Field

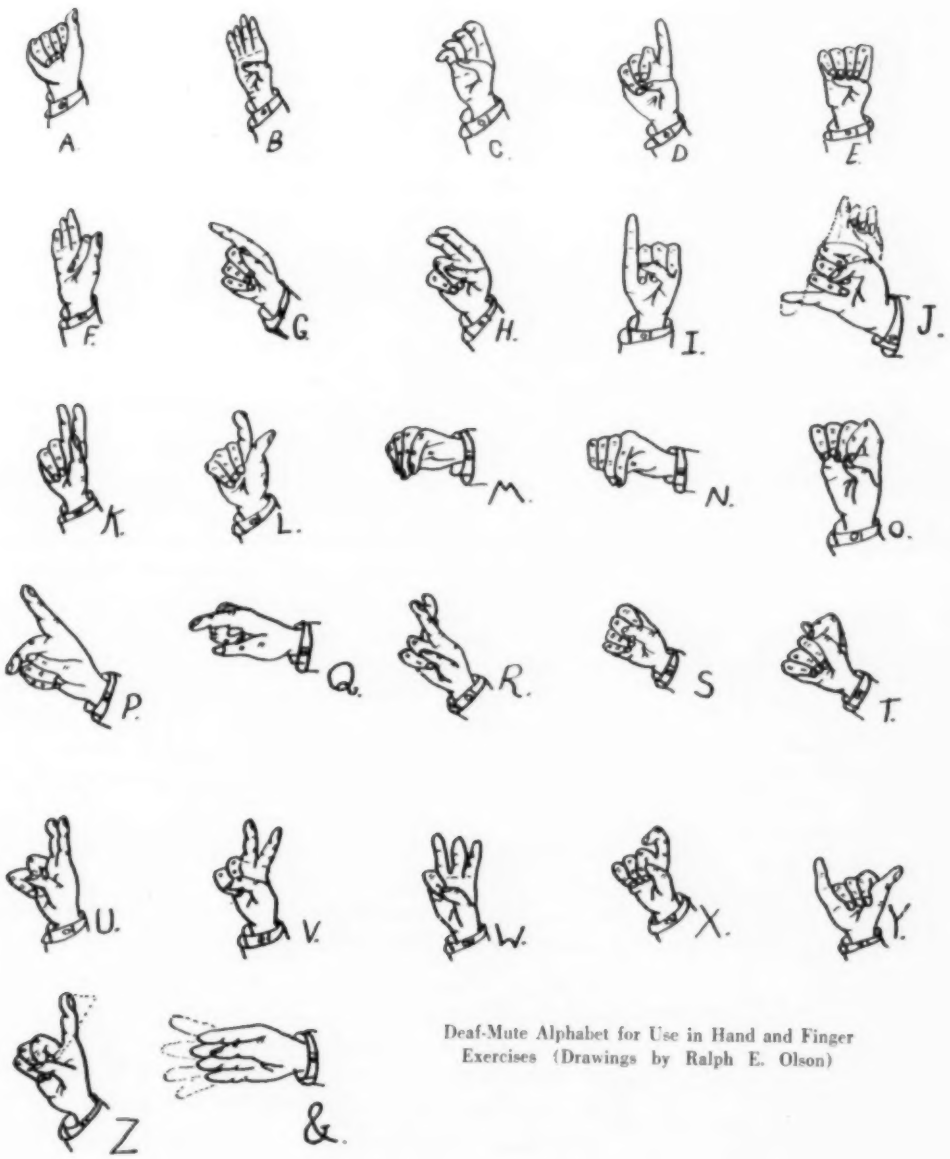
Exercises for the Disabled Hand: Deaf-Mute Alphabet

Frederick L. Aaron, B.S.

It is the purpose of this article to pass on to other physical therapists, a series of exercises which may aid in the reeducation and rehabilitation of the disabled hand. It is the hope of the author that these exercises, incorporated with others, may accelerate the course of recovery for patients who have reached a plateau in treatment. Use of the Deaf-Mute alphabet can prove a valuable addendum to hand exercises for many patients including those with hemiplegia or arthritis. These exercises contribute to the progress of the patient in the following ways:

1. Refined functions of the intrinsic and extrinsic musculature of the hand and forearm are encouraged by these exercises. The musculature of the whole upper extremity may be called into play without the patient being aware of this fact. They provide opportunity for the physical therapist to increase the patient's endurance factor.
2. There is a functional carry-over into daily self-care activities. Some examples are:
   a) The position attained by the hand in forming the letter "A" is related to the position of the hand necessary to holding a comb.
   b) The hand assumes the position necessary to threading and tightening a shoelace by forming the letter "Q".
   c) The hand assumes the position necessary to donning hosiery for women or boots for men in forming the "B" in an inverted position.
   d) The hand assumes the position necessary for grasping a glass in forming the letter "C".
3. The physical therapist should select letters and words to be spelled out, including those letters which the patient finds difficult to form because of limitation of motion or incoordination indicative of muscle weakness. Repetition of selected letters or words should be stressed.
4. The addition of these exercises to a program emphasizing coordination activities is suggested. It is especially beneficial when home exercises, assisted and supervised by a member of the patient's family, are an important part of the patient's program. Mimeographed drawings of the exercises may be sent home with the patient as a guide to correct performance. *The Boy Scouts of America Handbook* also contains a copy of this alphabet.
5. The interest of the patient in the exercises is generally high and because of this fact it is sometimes easier to gain increased cooperation in achieving other desirable goals in his rehabilitation program. The natural apathy displayed by some patients to a repeated program of exercises can be overcome and a sense of achievement developed when some letter, which was particularly difficult for the patient, has been performed. Group therapy provides excellent opportunities for motivation where two or more patients can be pitted against one another in a spirit of friendly competition.

Chief Physical Therapist, Physical Therapy Department, St. Frances Memorial Hospital, San Francisco.



Deaf-Mute Alphabet for Use in Hand and Finger Exercises (Drawings by Ralph E. Olson)

Editorial

A professional journal such as the *Physical Therapy Review* has as its basic responsibility the dissemination of knowledge and opinion directly relating to its specific field. This responsibility is reflected in the types of articles published, in the scope of context, and in the editorial philosophy expressed on this page each month; therefore, our readers anticipate comments and views related to professional topics directly applicable to physical therapy.

This month, however, we should like to expand our horizons and deal with some of the responsibilities each of us has as a citizen and a person. Actually this is not divorced from our status as physical therapists, since everyone who enters a profession automatically accepts the role of a community leader and the inherent obligations of humanitarian interest and activity. For many years it has been expected that the doctor, the lawyer, the teacher, the nurse and, more recently, members of allied professions would be found in the forefront of community activities. The very fact that these persons have chosen service as their life's work sets them apart in the eyes of the public as potentially willing to give more service to civic and political affairs.

As members of a profession we are expected to participate and contribute. The question then that must be asked is, "Are we fulfilling our obligations to public service, and how well are we meeting our total professional responsibilities"?

Limitation of interest and activity to technical aspects would be a tragic failure in a field such as ours where the end product of our work is the restoral of human ability to function. We work with people, and our ability to give to these people will certainly be in direct proportion to the breadth of our own outlook.

What, then, are some of the interests we should maintain? Doubtless many of you could name a score or more. Service organizations, youth clubs, local fund raising campaigns, community libraries, local school and church activities are among those we might name.

Editorial

It is our duty also to make a contribution to certain nation wide campaigns. Of particular interest to physical therapists should be the tremendous efforts made by the National Safety Council to stem the rising number of highway deaths and injuries. We should be vitally interested in this activity since our work so often brings us into contact with those very persons who become victims of auto crashes. There is much we could do individually and collectively through our chapters to support such a campaign.

Consider then the real implication of being a member of a profession. There is far more than competency of work and scientific knowledge of technic. This can be fully realized only through accepting responsibility as a contributing member of society.

E. JANE CARLIN

Sara Jane Houtz Appointed Editor

The Board of Directors announces the appointment of Sara Jane Houtz as Editor-in-Chief of the *Physical Therapy Review* beginning July 1, 1956. Miss Houtz succeeds Eleanor Jane Carlin who has been elected President of the American Physical Therapy Association.

Miss Carlin has served ably as Editor-in-Chief since August 1950 during which time the *Review* has shown outstanding development. In accepting Miss Carlin's resignation the Board of Directors unanimously expressed the great appreciation of the Association for her contribution as Editor-in-Chief.

Miss Houtz served on the Editorial Board of the *Physical Therapy Review* from November 1952 to January 1955 and was in charge of the Abstract Section where she gave much initiative and leadership to the development of the Abstract Section as well as to general editorial policies. She is Educational and Research Consultant of the Detroit Orthopaedic Clinic and has in the past served as Chairman of the Research Section meetings which have been a part of the Annual Association Conferences. She has been author and co-author of seven articles published in the *Review* since 1946.

School of Physical Therapy Approved

The Council on Medical Education and Hospitals of the American Medical Association at its last meeting approved the physical therapy curriculum at the School of Medicine, Marquette University, Milwaukee, Wisconsin. Miss Beth J. Phillips is the Physical Therapy Director; Dr. Ray Piaskoski, the Medical Director.

Board of Directors Elected for 1956-58

The following officers and directors were elected by the House of Delegates in New York on June 16, 1956:

President, E. Jane Carlin, Jenkintown, Pennsylvania

Vice-President, Helen Vaughn, Washington, D. C.

Secretary, Louise Bailey, Chicago, Illinois

Treasurer, Dorothy Hoag, Denver, Colorado

Speaker of the House of Delegates, Agnes Snyder, Washington, D. C.

Directors for Four Years

Dorothy Graves, Los Angeles, California

Susanne Hirt, Richmond, Virginia

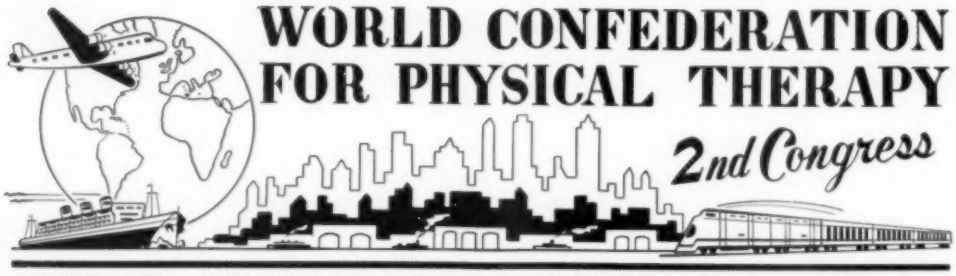
Director for Two Years to fill the unexpired term of Sarah Rogers

Mary E. Nesbitt, Boston, Massachusetts

Harriet Lee, Washington, D. C. was elected in 1954 for a four year term as director and continues to serve.

Second International Congress on Dietetics

Representatives of eighteen countries are scheduled to speak at the Second International Congress on Dietetics to be held in Rome September 10-14. The United States will be well represented by nine program participants and it is anticipated that one hundred persons from this country will attend the Congress. The first congress was held in Amsterdam, Holland, in 1952.



WORLD CONFEDERATION FOR PHYSICAL THERAPY

2nd Congress

JUNE 17—23, 1956 · HOTEL STATLER · NEW YORK, N.Y.

Presidential Greeting

Miss Mildred Elson, President
World Confederation for Physical Therapy
American Physical Therapy Association
1790 Broadway, New York, N. Y.

To you and your colleagues from all over the world who are attending the Second Congress of the World Confederation for Physical Therapy, I extend best wishes for a most successful Congress. In meeting together you are not only sharing scientific and clinical knowledge about your important profession; you are also forging the links of international friendship and understanding which are essential to world peace.

DWIGHT D. EISENHOWER

Summary of Attendance

(The deadline for this issue of the *Review* coincided with the end of the Congress, permitting only the inclusion of the summary of attendance. There will be more news in subsequent issues and selected papers will appear throughout the year.—Editor)

Total attendance: 2,486 (including 285 exhibitors' representatives)

Total number countries represented: 39

United States: 1,733. Of this number 1,401 were physical therapists.

Canada: 196. Of this number 169 were physical therapists.

Others: 272. Of this number 240 were physical therapists.

Representation from other countries was as follows:

Algeria	1
*Argentina	1
Australia	30
Austria	1
Belgium	2
Brazil	1
British Guiana	1
Colombia	4
Cuba	3
Denmark	12
Egypt	1
Eire	2
Finland	5
France	9
Germany	13
Great Britain (Including Scotland—8, and N. Ireland—3.)	99
*Haiti	1
Holland	10
India	2
*Indonesia	1
Iran	1
Israel	1
Kenya	1
*Korea	3
Malaya	1
Mexico	4
New Zealand	3
Northern Rhodesia	1
Norway	16
*Portugal	1
*Russia	2
South Africa	4
Sweden	25
Thailand	2
Trinidad (B.W.I.)	2
*Turkey	3
Venezuela	2

* These countries were represented by physicians since they have no physical therapy program.

Proceedings of Second Congress

All papers given at the Second Congress of the World Confederation for Physical Therapy will be bound in a single volume to be available no later than January 1, 1957. The *Proceedings* can be ordered from the American Physical Therapy Association, 1790 Broadway, New York 19, New York, at $3.00 a copy. (For shipment outside the United States add 25 cents for postage.)

Association Activities

National Office Statistical Reports....

Department of Chapters and Membership

Membership Report

May 1, 1955 — April 30, 1956

New members:	
Active	608*
Inactive	2
Associate	1
Reinstatements:	
Active	62
Inactive	10
Life	1
Transfers:	
Active to Inactive	312
Inactive to Active	62
Active to Life	4
Inactive to Life	1
Resignations:	
Active	33
Inactive	32
Associate	3
Deceased:	
Active	7
Inactive	3
Life	1
Dropped for nonpayment of dues:	
Active	86
Inactive	58
Associate	2
Total Membership, May 1, 1955:	
Active	4,718
Inactive	1,282
Associate	46
Honorary	9
Life	44
Student	693
Total:	6,792

* Includes 48 who were not recent graduates and 24 foreign trained.

Total Membership, May 1, 1956:		
Active	5,008	
Inactive	1,450	
Associate	42	
Honorary	9	
Life	49	
Student	780	
Total:		7,338
Net gain in membership:		546

The following members passed away during the year 1955–56:

Grace Cinquemani	Ann Kelley
Marjorie Crawford	Isabelle Lazin
Muriel DeCastro	Mary Thompson
Treth DeVerelle	Helen Varelia
Ida Hazenhyer	Eileen Webster

Lydia Wright

Foreign Trained Membership Program

May 1, 1955 — April 30, 1956

Candidates who completed the period of supervised employment and satisfactorily completed the qualifying examination: 21

These physical therapists were trained in the following countries:

Australia	1
Canada	4
Denmark	4
Great Britain	8
New Zealand	1
Norway	3

Candidates who completed period of supervised employment but failed one or more parts of the examination: 5

These candidates were trained in the following countries:

Denmark	3
Germany	2

Candidates accepted for full membership after completing two-year program: 2

Candidates now completing period of supervised employment and scheduled to take examination in the future: (Also included in this category are candidates who failed exam and plan to retake it.) 41

These 41 candidates were trained in the following countries:

Australia	1
Canada	6
Denmark	4
Germany	6
Great Britain	11
Norway	7
Sweden	6

NOTE—See additional information in report of the Department of Professional Services regarding physical therapists from foreign countries who did not complete membership requirements for the APTA and were transferred to the Closed File.

Field Service

May 1, 1955 — April 30, 1956

During the year consultants from the National Office met with chapters and/or districts or chapter executive committees as follows:

Arizona	Western Missouri
Arkansas	Nevada
Northern California	New Hampshire
District of Columbia	New Mexico
Florida	Western New York
Indiana	North Carolina
Iowa	Puerto Rico
Louisiana	Rhode Island
Maryland	Utah
Massachusetts	Virginia
	West Virginia

Department of Professional Services

May 1, 1955 - April 30, 1956

Placement Service

358 American Physical Therapy Association members have had the assistance of our Placement Service.

129 American Physical Therapy Association members were receiving assistance as of April 30, 1956.

229 American Physical Therapy Association members were removed from Placement Service files following reports that their needs had been met.

417 Facilities were active in our Placement Service as of April 30, 1956.

647 Physical therapists were being requested for these 417 facilities.

46 Facilities have requested assistance and will become active upon receipt of additional information.

404 Facilities have been closed from Placement Services files following written reports that their needs have been met.

867 Facilities have had, or are presently having, the assistance of our Placement Service.

Poliomyelitis Assignment Service

2 Physical therapists were on duty as of May 1, 1955.

47 Physical therapists were assigned during the year.

3 Assignments were cancelled before physical therapists reported for duty.

41 Physical therapists completed emergency duty assignments.

9 Physical therapists accepted permanent positions in the area to which they had been assigned.

5 Physical therapists are on duty as of May 1, 1956 in the following states: 2—Massachusetts, 1—Rhode Island, 1—Texas, 1—Wisconsin.

Service to Foreign Trained Physical Therapists

82 Physical therapists (foreign trained) are active in the Department of Professional Services, pending final commitments (reporting for traineeship, observation period, paying fee, etc.).

28 Physical therapists (foreign trained) are coming to the United States on a permanent visa.

54 Physical therapists (foreign trained) are coming to the United States on an exchange-visitor, student or visitor visa.

54 Physical therapists (foreign trained) were transferred from the Department of Professional Services to the Membership Division.

40 Physical therapists (foreign trained) are on probationary membership status and working under the supervision of APTA members.

14 Physical therapists (foreign trained) are on a traineeship status and gaining experience under the supervision of APTA members.

60 Physical therapists (foreign trained) were closed from the files of the American Physical Therapy Association.

37 Physical therapists (foreign trained) came into the United States on a permanent or immigration visa, but did not complete membership requirements for the American Physical Therapy Association. Twelve of these physical therapists returned to their native countries before completing their year of supervised experience.

23 Physical therapists (foreign trained) who came into the United States on an exchange-visitor, student or visitor visa have completed their temporary period in the United States and have returned to their native countries.

196 Foreign trained physical therapists have received assistance through the Department of Professional Services.

Field Advisory Service

State and Cities	Facilities
California:	
Hondo	1
Los Angeles	3
Loma Linda	1
Palo Alto	2
San Francisco	3
San Leander	1
San Luis Obispo	3
Santa Ana	4
Vallejo	1
District of Columbia:	
Washington	2
Illinois:	
Aurora	3
Champaign	2
Chicago	6
Elgin	2
Oak Park	1
Rockland	5
Springfield	4
Kansas:	
Kansas City	2
Kentucky:	
Ashland	1
Covington	2
Lexington	6
Louisville	12
Massachusetts:	
Boston	14
Leominster	1
Salem	1
Wellesley	1
Missouri:	
Kansas City	3
New Hampshire:	
Concord	2
Greenfield	1
Hanover	1
Keene	1
Manchester	2
Portsmouth	1
New York:	
New York	1
Rochester	7
Rhode Island:	
North Providence	1
Providence	2
West Virginia:	
Huntington	3

Total 10 States, plus District of Columbia, 38 Cities; 108 Facilities.

Department of Professional Education

Annual Enrollment Analysis for 1952-53-54-55

Enrollment	1952	Schools	1953	Schools	1954	Schools	1955	Schools
Freshmen	184	13	234	12	313	13	387	14
Sophomores	183	13	190	14	328	15	372	16
Juniors	223	17	208	16	363	21	428	22
Seniors	74	7	202	20	295	25	367	24
Certificate	511	26	388	26	361	27	375	27
Totals	1,175		1,222		1,660		1,929	

Observations Re Enrollment (including Marquette and Ohio State University):

23 per cent increase in total enrollment in 1955 over 1954

16 per cent increase in final year students in 1955 over 1954

28 per cent increase in students enrolled in degree or more-than-one-year certificate programs. (Mayo and Puerto Rico only certificate programs included.)

81 per cent of total enrollment are in degree programs. (Mayo and Puerto Rico excluded in this tabulation.)

2 per cent increase in enrollment in one-year certificate programs in 1955 over 1954. (Mayo and Puerto Rico only certificate programs excluded in this tabulation.)

Low grade point average was the predominant reason for rejection. Students should be urged to get in touch *early* with the physical therapy director of the school of their choice.

Physical Therapy Review

Circulation and Advertising Report

May 1, 1955 — April 30, 1956

Total Circulation 1955–56

Members	5,811	
Nonmembers	1,273	
Foreign subscriptions to 57 countries included	408	
	Total:	7,084

Total Circulation 1954–55

Members	5,654	
Nonmembers	1,237	
Foreign subscriptions to 47 countries included	333	
	Total:	6,891

Increase in Circulation: 193

Advertising 1955–56

139 pages of space advertising
20 pages of classified

Advertising 1954–55

123 pages of space advertising
15 pages of classified

Increase in Advertising:

16 pages of space advertising
5 pages of classified

Special Issues 1955–56

June 1955—Conference Issue
November 1955—Rehabilitation Issue

The *Review* goes to the following 56 foreign countries:

Arabia	1
Argentina	4
Australia	47
Austria	1
Belgium	12
Bermuda	1
Brazil	8
Canada	72
Canal Zone	2
Canary Islands	1
Chile	3
Colombia	6
Cuba	9
Czechoslovakia	3
Denmark	14
Egypt	2
England	21
Finland	5
France	11
Germany	6
Greece	4
*Guam	1
Guatemala	1
Haiti	2
Holland	9
Honduras	1
Hong Kong	1
Iceland	1
India	8
Israel	21
Italy	11
Jamaica	1
Japan	5
Korea	2
Lebanon	1
Liberia	2
Mexico	12
New Zealand	3
Norfolk Islands	1
Norway	23
Pakistan	5
Philippines	2
Portugal	1
Roumania	1
Singapore	1
South Wales	1
Sweden	22
Switzerland	8
Trinidad	1
Turkey	1
Union of South Africa	11
Union of Soviet Socialist Republics	6
Uruguay	7
Venezuela	1
Yugoslavia	2
*W. Caroline Islands	1
1955-56	408
1954-55	352
Increase	56

*Protectorate.

Annual Meeting of American Occupational Therapy Association

The 1956 Conference of the American Occupational Therapy Association will be held from September 29 through October 5 in Minneapolis, Minnesota, at the Nicollet Hotel.

The theme of the Conference will be "Time for Reflection," and the topics will include: Occupational Therapy in Relation to General Medicine and Surgery, Geriatrics, Pediatrics, Physical Disabilities, and Psychiatry.

Marriages

Marion T. Bergen, of Ann Arbor, Mich., now Mrs. Marion B. Paterson, Ann Arbor.

Diane H. Blumenstock, of Madison, Wis., now Mrs. Diane B. Chiri, Madison.

Edith Borchardt, of Chicago, Ill., to Henry Scott, Jr., Chicago.

Corinne C. Dickie, of Bethlehem, Pa., to Edwin R. Knerr, Allentown, Pa.

Ruth Eisenstadt, of Dorchester, Mass., to Robert Galante, Concord, Mass.

Dorothy Freeman, of Springfield, Mass., now Mrs. Dorothy F. Birchenough, Springfield.

Florence Greene, of Los Angeles, Calif., now Mrs. Florence G. Wilson, Los Angeles.

Jean Hunt, of Jacksonville, Fla., now Mrs. Jean H. Vaught, Jacksonville.

Harriet Karp, of Long Branch, N. J., to Bruno Zarkower, Stamford, Conn.

Antoinette Lodato, of Stamford, Conn., now Mrs. Antoinette L. Zezima, Stamford.

Mrs. Barbara Veissi Donaldson, Belvedere, California, passed away recently. Mrs. Donaldson received the certificate in physical therapy at the Children's Hospital Society School of Physical Therapy, Los Angeles, in 1943. She served in the Women's Medical Specialist Corps, Army of the United States, and upon discharge was self-employed in Phoenix, Arizona, and San Francisco. Mrs. Donaldson had been a member of the Association since 1943.

John Ryan of Oklahoma City, Oklahoma, passed away on June 8, 1956. Mr. Ryan received a certificate in Physical Therapy from Mayo Clinic in 1942. He had been Chief Physical Therapist with McBride Bone and Joint Clinic in Oklahoma City for eleven years and, at the time of his death, vas Chief Physical Therapist at Wesley Hospital in Oklahoma city.

Mr. Ryan was a member of the American Physical Therapy Association, having been an active member of the Oklahoma Chapter until his recent illness, a member of the American Registry of Physical Therapists, and was registered in the State of Oklahoma.

His wife, Mrs. Cecilia Ryan, and one son, Lee, survive.

Civil Defense Week

President Eisenhower has approved the designation of September 9 through 15 as America's first Civil Defense Week. The Federal Civil Defense Administration with the cooperation of State and City Civil Defense organizations will endeavor to make CD Week an outstanding milestone of American civil defense progress.

The purpose of Civil Defense Week is to pay tribute to the workers and organizations for their efforts in behalf of our nation. Civil Defense Week provides the opportunity to promote public interest in and understanding of civil defense as a means of protecting our people, safeguarding our freedom and constructing an enduring peace.

A new Leadership Guide has been prepared to aid in making Civil Defense Week an outstanding community event. The guide may be obtained by contacting the local Civil Defense Director or by writing to Federal Civil Defense Administration, Battle Creek, Michigan.

Short Term Courses

Columbia University

Announcement has been received of the following short term course available to physicians, occupational, physical, speech therapists, and nurses with proper qualifications and experience.

Name of Course

Postgraduate Cerebral Palsy Course

Sponsor of Course

Columbia University—College of Physicians and Surgeons

Dates of Course

Physicians' Course—
October 15—November 2, 1956
March 4—March 22, 1957

Physical, Occupational, and Speech Therapists' and Nurses' Course—
October 15—December 14, 1956
March 4—May 3, 1957

Course Content

An interdisciplinary approach to cerebral palsy is presented through lectures, demonstrations, clinical affiliations and discussion seminars. Students are encouraged to acquaint themselves with all technics, weighing the contribution of each to the needs of specific patients. There is ample opportunity to question authorities in the field, to exchange experience, and to apply critical thinking toward the development of a dynamic approach to the problems involved.

Tuition

Physicians' Course—$100.00
Course for Physical Therapists, Occupational Therapists, Speech Therapists, and Nurses—$210.00 (8 points credit)

For further information and a list of scholarship sources contact:

Postgraduate Course in Cerebral Palsy
Office of the Dean
College of Physicians and Surgeons
630 West 168 Street
New York 32, N. Y.

New York University—Bellevue Medical Center

Name of Course

Advanced Course in Physical Rehabilitation Methods

Sponsor of Course

New York University–Bellevue Medical Center, The Institute of Physical Medicine and Rehabilitation in conjunction with New York University, School of Education

Dates of Course

November 19—December 14, 1956
February 4—March 1, 1957
April 29—May 24, 1957

Course Content

Course includes lectures and demonstrations of all aspects of

1. severe disabilities and their rehabilitation; theory, technics,
2. teaching methods and tests of programs; and opportunities for clinical experience.

Academic Credit

4 points at either graduate or undergraduate level

Fees

Tuition—$100.00 ($25.00 per point)
Registration—$7.00

For further information and application write to:

Mrs. Edith Buchwald Lawton
Director, Rehabilitation Courses for Physical Therapists
Institute of Physical Medicine and Rehabilitation
400 East 34th Street
New York 16, N. Y.

New Student Members

Mayo Clinic
Bernard McGahan

New York University
Lawrence Stano

Puerto Rico School

Orlando P. Aponte	Reinaldo R. Deliz
Zaida P. Berrios	Norma E. Gonzales
Carmen H. Calderon	Hilda I. LeHardy
Rosita A. deAlvarez	Nicholas C. Rodriguez
Luz B. deHernandez	Helga S. Soles
Olga Pineiro Deliz	Rosa S. Vigo

St. Louis University
Sister Mary A. Garrison

University of Connecticut

Joanne Boynton	Beverly Peplau
Jane H. Bradshaw	Carol Pisano
Margaret Bushnell	Whitney R. Powers
George W. Case	Marjorie Rinfrett
Phyllis Herman	Joseph Rossano
Lois Ineson	Helen Seigmeister
Frank R. Kneen	Edward Sluzenski
Susan Morsheimer	Alta J. Talbert

Carol A. Waterfield

University of Minnesota
Nancy Mix

University of Oklahoma
Barbara Roads

New Publication on the Career of a Rehabilitation Counselor

The National Rehabilitation Association and the National Vocational Guidance Association announce publication of a new informative guide entitled "Rehabilitation Counselor Preparation." It has been designed to meet the needs of expanded counseling services. Those sponsoring training programs for vocational rehabilitation counselors have raised many timely questions which were discussed in a series of workshops supported by the above organizations and the Office of Vocational Rehabilitation. Their findings are reported in this publication.

Such queries as the following are answered: What is the job of the rehabilitation counselor? What is the scope and what are the limitations of his responsibilities? Under whose auspices should his training be planned and how long should it take? In what areas of preparation should he be competent? Does he need supervisory experience and in what institutional setting should he work?

This 78 page paper-bound book will be of interest to counselor trainers, prospective students, trainees and general guidance counselors. Purchase price is $1.00 per single copy, slightly less for larger orders. Correspondence should be directed to:

National Rehabilitation Association
1025 Vermont Ave. N.W.
Washington 5, D.C.
or
National Vocational Guidance Association
1534 O Street N.W.
Washington 5, D.C.

Donald V. Wilson Receives Goodwill Award

The 1956 Goodwill Award, given annually by Goodwill Industries of America, Inc. for outstanding service to handicapped people, was presented to Donald V. Wilson, Secretary-General of the International Society for the Welfare of Cripples on June 23.

Mr. Wilson was selected for the award because of his achievement in developing interest in and coordinating services to handicapped people on an international scale since assuming his present position in 1949. Under Mr. Wilson's administration, the International Society for the Welfare of Cripples has grown to include 22 affiliated national organizations in as many countries.

Author of "Hand Talking Chart" Announces New Publication

Hamilton Cameron, M.D. New York City, announces the recently incorporated International Research Council, the first world-wide medical confraternity for the dissemination of knowledge concerning aphasias associated with hemiplegia, The aims of the council include: the establishment of a clearing house on the subject, and the publication of a monthly *Review-Bulletin*.

In January 1943, Dr. Cameron became one of the 600,000 hemiplegia aphasics. He devised a 'Hand Talking Chart' that has proven a practical clinical aid. This has been a boon to those vocally paralyzed who hitherto had no such means of communication with those around them.

For gratis copies of the Chart and the detail information of the nature and aims of the International Research Council, address, Dr. Hamilton Cameron, General Director, 601 West 110th St., New York 25, N. Y.

Index to Current Literature

ADAPTIVE EQUIPMENT, APPARATUS AND BRACES

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Integration of Basic Science with Clinical Training. Howard P. Lewis, J.A.M.A., 161:27-29, May 5, 1956

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Abstracts

The Reflex Responses to Inflation or Deflation of the Lungs and Their Importance in the Regulation of Respiration

J. Garcia Ramos, AM. REV. TUBERC., 73:519-528, April 1956

It is known that inflation or deflation of the lungs produces marked changes in the rate of breathing. However, in all reviews on control of respiration, this control is mainly attributed to oxygen and carbon dioxide tensions and to hydrogen ion concentration. The inflation and deflation reflex responses are accorded only a small part. With the growth of thoracic surgery, however, and its resulting inflation or collapse of part or all of a lung, it is necessary to consider to what an extent the accompanying changes can be due to the activity of these reflexes. In some patients in whom part of the lung tissue has been excised, and in whom resection has not been followed by thoracoplasty a great reduction in diaphragm movement has been reported. In these patients the remaining lung tissue is stretched in order to fill the chest cavity. There have also been some reports on patients with emphysema, in whom the collapse of the distended lung has been followed by a reduction of dyspnea. The question arises: Does the Hering-Breuer reflex maintain inhibited respiratory movements for long periods of time, even if there is some degree of superimposed asphyxia? The purpose of this study is to try to obtain experimental data to answer that question.

In anesthetized rabbits the respiratory responses to inflation and deflation of the lung were measured. Pulmonary ventilation, electrical activity of the diaphragm and oxygen saturation were measured and recorded. The results show: that there is a definite relationship between stimulus and response; that this relationship does not change with anesthesia up to the surgical level or with moderate increase or decrease of oxygen or carbon dioxide tension in the inspired air; that the Hering-Breuer reflex can maintain a level in pulmonary ventilation for indefinite periods of time; and that the organism adapts itself more easily to changes of the gas tensions in the blood than to the Hering-Breuer reflex.

The present results can then explain the clinical observations mentioned above—the impairment of lung ventilation after partial lung resection without thoracoplasty, the decrease of respiratory activity in emphysema and asthma, where the loss of elasticity and destruction of lung tissue produces some degree of distention of the rest of the alveoli.

Rehabilitation Following Thoracic Surgery

Gladys M. Storey, BRIT. J. PHYS. MED., 19:73-79, April 1956

If the rehabilitation of the thoracic surgery patient is to be a success, it should start as soon as the decision to operate has been made. The expected degree of return to normal depends entirely upon the diagnosis and the type of surgery performed. It is therefore essential that the physical therapist have a clear understanding of all aspects of the disease, its prognosis, and the effects of surgery.

The treatment program is divided into preoperative training and postoperative training. The basic duties of the physical therapist in each part are discussed in detail. Preoperative training may include an exercise tolerance test, a test of the efficiency of respiration, breathing exercises, exercises to improve muscle tone and mobility, and an explanation of the postoperative training. There are certain conditions which require special preoperative care—those patients who have a phrenic nerve crush, those who have esophageal or gastric lesions, those who have an excessive production of sputum, and those who have weak muscles and poor posture.

The postoperative treatment is divided into two phases—the immediate postoperative period in the hospital and the convalescent period in a convalescent home or rehabilitation center. In the first of these two phases it is important for the physical therapist to try to restore respiratory function as soon as possible by encouraging the patient to concentrate on expiration, coughing, expectoration, and finally to increase expansion in all areas, especially the basal area. In this phase also, movements of the feet and legs are encouraged; a careful check is kept on the satisfactory functioning of the intercostal drainage tube; and efficient respiration must be restored if paradoxical respiration occurs. This first physical therapy treatment should be started about an hour after the patient's return from the operating room, and continued in the afternoon. From this time onward the physical therapy program may be divided into four parts: (1) the maintenance of correct posture, (2) the increase of respiratory efficiency, (3) the establishment of coughing and expectoration, and (4) the maintenance of mobility and restoration of function of all parts of the body.

When the patient leaves the hospital it is usual for him to have a period of convalescence either at a convalescent home, on holiday with the family, or at a rehabilitation center. The aim is basically to improve the patient's general health and to give him confidence in his ability to return to employment. Where this is not possible, his capabilities should be tested, and in some cases he should be trained in some new or more suitable occupation.

Muscular Dystrophy—I. History, Clinical Status, Muscle Strength, and Biopsy Findings

G. H. Fetterman, M. J. Wratney, J. S. Donaldson, and T. S. Danowski, AM. J. DIS. CHILD., 91:326-338, April 1956

This is the first of a series of papers on muscular dystrophy which are appearing in the above journal. It is a report of the findings from a study of 31 children with a history of motor weakness suggestive of muscular dystrophy. The authors wished to repeat and reassess some of the older clinical and laboratory observations.

The group in this study consists of 27 boys and 4 girls. The study includes a history of the familial incidence, if any, the onset, the present status of the patient, the strength of muscle groups, biopsies of deltoid and gastrocnemius, and a reevaluation of muscle strength at intervals following biopsy.

Almost one-third of the children had one or more siblings who had progressive loss of muscle strength. The illness had been present on the maternal side in one instance and not at all on the paternal. The age of onset and pertinent information concerning their physical status are summarized in a table. The muscle strength was evaluated by a physical therapist. From these tests the 31 patients were arranged in order according to the averaged strength of trunk, abdominal, lower extremity, neck, and upper extremity muscle

groups. It was found that all the muscle groups tested showed impairment, even though weakness in some muscle groups had not been grossly apparent clinically. Normal function was usually found only in muscle groups of the hands and feet. The involvement appeared to be symmetrical and equal, with the loss of strength more pronounced in the lower extremities.

Biopsy specimens were obtained in 22 of the patients. The most characteristic histologic finding was in the pattern of involvement, that is, the presence of swollen, degenerated, or atrophic muscle fibers, intermingled with normal fibers. Interstitial changes included fatty infiltration and/or fibrosis. An attempt was made to evaluate the intensity of the lesion with the clinical status of the patient. The findings show a high positive correlation between the pathological change and the clinical status in patients with muscle strength reduced below 50 per cent of normal. On the other hand the presence of far advanced pathological change in the group with muscle strength still above 50 per cent indicates that the pathological change precedes clinical deterioration. There was no evidence that the biopsy procedure by itself produced any harmful effects upon the muscle strength.

Surgical Procedures of Value in Rheumatoid Arthritis

Robert Harris, CANAD. M.A.J., 74: 512-514, April 1, 1956

Certain surgical procedures are of definite value in the treatment of rheumatoid arthritis. This paper reviews the experience of the orthopedic service of the Toronto General Hospital during the past few years. Here 54 operations were performed on 34 arthritic patients.

This group of patients indicated general findings as follows: 1. Surgical procedures do not affect the course of this systemic illness. However, surgery should be withheld until the disease is relatively quiescent. 2. Arthroplasty by the excision method is almost certain to produce increased movement. The instability produced is so great as to make it of little value in weight-bearing joints. In these, some form of replacement arthroplasty is required. 3. Arthrodesis remains the most effective method of reducing pain, and is the most useful procedure in weight-bearing joints which have little movement and much pain. 4. Division of soft tissue or bone for the release of flexion contractures is of definite value, and should probably be performed rather earlier than is customary, particularly in the knee joint.

Physiologic Basis for Rational Therapy in Chronic Pulmonary Emphysema

James J. Feffer and James P. Mann, POSTGRAD. MED., 19:332-340, April 1956

A better understanding of the pathophysiology of obstructive pulmonary emphysema has led to a logical therapeutic approach and to more favorable clinical results. There is evidence that a large portion of the disability in emphysema is caused by a disturbed pulmonary physiology and not by organic changes.

The basic abnormality appears to be obstruction to expiratory air flow. This obstruction is due to a combination of three factors — a spasm of the walls of the smaller bronchi and bronchioles, an edema of the respiratory mucosa, and the presence of increased secretions. Each of these components tends to reduce the size of the bronchial lumina. These three factors plus normal physiologic contraction of the bronchi on expiration, make it impossible to expel all the inspired air from the lungs and consequently result in "trapping."

Various types of therapy are described — nebulization therapy, evacuation of bronchial secretions, hormone therapy, and breathing exercises. Postural drainage is mentioned as a most important method of evacuating secretions. It is stated that breathing exercises will improve ventilation efficiency; that increased diaphragmatic excursion can be developed by special training and daily practice. Patients with emphysema often require specific treatment for recurrent acute bronchitis and bronchopneumonia, polycythemia, cor pulmonale, and respiratory acidosis. These are discussed in detail.

An adequate therapeutic program must utilize a combination of methods selected to fit the needs of the individual patient. Physiologically directed therapy involves the use of procedures which restore or maintain the function of the respiratory system. Life expectancy will be increased in practically all of the adequately treated patients and the majority will experience significant improvement in exercise tolerance.

The Phantom Limb

Andor A. Weiss, ANN. INT. MED., 44: 668-677, April 1956

In spite of the rather extensive literature about the phantom limb, there is still much variance of opinion as to its etiology and treatment.

There is evidently a difference between the "natural phantom" that an amputee experiences and the painful phantom limb. The "natural phantom" is that rather painless sensation in which the patient feels that the extremity is still present; he may even feel he is moving the part. These sensations are not present in the congenital amputee and usually disappear in the acquired after several years.

Often, the more painful sensations of tingling, burning, or cramping occur in the stump of the amputee. The pain of the phantom limb varies in intensity and type.

There are 3 theories concerning the etiology of the phantom limb: (1) peripheral, (2) central and (3) psychogenic. The mechanism of production of pain due to peripheral origin is a vicious cycle. Painful sensations from an infected stump or neuroma may start a chain of events that leads to severe persistent pain. The painful impulses may set off an autonomic impulse with vasospasm and a cold, clammy, and increasingly painful stump. Treatments generally consist of resection of neuromas or sympathectomy; sometimes, repeated percussion of the stump neuroma is helpful.

The adherents of the "central" theory invoke the cerebral "body image" concept to explain the phantom phenomenon. As a result of various sensations the person builds up an image of himself in the world. The parts of the body more richly supplied with nerves—such as the hands—have a stronger cerebral representation and, therefore, are felt to be present more often following amputation.

The phantom limb is probably a combination of peripheral and central —the former to explain the pain and the latter to explain the true phantom. In addition to these explanations of organic etiology, there is a psychogenic aspect in most cases. The loss of a limb is a psychic trauma which is difficult to accept. Herein psychotherapy and shock therapy are advocated by some physicians. Posterior chordotomy, prefrontal lobotomy, and removal of cerebral sensory area are also advocated by other authorities.

The author feels that an early restoration of function is of vital

importance. Concomitant with this idea is pre- and postoperative counseling with the patient, exercise, bandaging, positioning, and prevention of infection of the stump. The patient should be stood up soon, a pylon fitted, and early ambulation started.

The Child with the Upper Extremity Amputation

Carol D. Halpern, AM. J. OCCUP. THERAPY, 10 (Part I): 50-56, March-April, 1956

The majority of children with upper extremity amputations are congenital cases. The most common type is the unilateral below-elbow amputee. This article is concerned with below-elbow amputation and is based on experience with 21 children between the ages of 3½ and 15 years with congenital amputations.

The child should be fitted with a prosthesis when he is very young so he can appear, act and feel more nearly normal. As a child he will not miss his arm too much and can function very well with the stump; however, as he grows older, certain tasks can best be done with two "hands" and he will become more self-conscious of his "empty sleeve." Ideally it is good to fit the child with a prosthesis before he develops excessive and abnormal use of the stump. Best results have been obtained with the preschool child.

The prosthesis used is of a regular type, scaled for children. The terminal device may be a hook which is more functional or a hand which has the cosmetic advantage. In either case, the terminal device is opened by arm flexion and closes due to tension exerted on rubber bands. The rest of the prosthesis consists of wrist device, adjustable for various positions of supination-pronation, forearm socket, elbow device, arm cuff and harness.

After the prosthesis is carefully checked for fit and function, the training stage begins. The program is more concentrated during the first 2 weeks. The child needs much encouragement and correction in the use of the prosthesis. Bimanual activities must be varied and of interest to him. The child must learn two important things in control training: (1) to become aware of the minimum amount of shoulder flexion necessary to open the terminal device, and (2) to be able to open the device at various angles of elbow flexion-extension.

The parents should also be well oriented in care of the prosthesis, its limitations and uses, and the importance of clinical follow-up.

The Degenerative Disc Syndrome of the Low Back

Allen M. Ferry, VIRGINIA M. MONTHLY, 83:146-150, April 1956

The degenerative disc syndrome of the low back is a prevalent problem of many people. There are difficulties in its diagnosis and correction. The best treatment, therefore, is prevention. Such degeneration of the disc begins at maturity and is increased by trauma, stress and most important, by faulty posture.

Extension of the back causes a decrease in size of the neural canals. With conditions that further limit the canal size, pressure is readily placed on the nerve roots causing pain. Extension of the back also narrows the posterior portion of the intervertebral space. This position of repeated hyperextension, as evident in sway back or lordosis, causes continued pressure developing in posterolateral disc protrusion.

The differential diagnosis between true low back disc derangement and strains is difficult. X rays, particularly in the standing position, may help. A series of 200 x-ray films revealed that in 84 per cent of the patients, who were in the neutral or normal standing position, the lumbosacral or L4-L5 joints were extended. This factor is significant in the cause of and treatment for low back pain and degenerative disc syndrome.

The treatment indicated is conservative, with surgery being postponed if at all possible. The patient should be immobilized in bed in a partially flexed position during the acute stage. Heat and massage should be started early. When acute symptoms have subsided, a progressive regime of abdominal exercises and low back stretching is begun. When sitting and standing is allowed, emphasis is on posture, maintaining the pelvic tilt, or flattening of the low back. With this conservative program many of the difficulties can be corrected. It is especially important to try posture correction since the patient may not have a ruptured disc. The operation in itself is not without risk. If it seems that surgery cannot be avoided, good after care of the back is essential to prevent further trouble from developing.

Femoral Periarterial Sympathectomy for Delayed Healing After Amputation

Ruscoe Clarke and Mary Fisher, LANCET, (No. 6919): 364-366, April 7, 1956

Femoral periarterial sympathectomy has been used for various vasomotor and trophic disturbances of the extremities including Raynaud's disease, diabetic and arteriosclerotic gangrene, chronic ulceration of the leg, frostbite and causalgia. The results have varied.

Frequently the problems of delayed healing and necrosis occur after amputation in patients with arteriosclerotic gangrene. Other methods of repeated higher amputation may solve the problem of necrosis, but one is hesitant of a second and more proximal amputation. Lumbar sympathectomy has a more widespread and lasting effect, but this is no minor operation for the frail and elderly patient.

Both of the reported cases in this paper had arteriosclerotic gangrene necessitating midthigh amputation. Postsurgically, usual medications were used including tolazoline and penicillin. The wounds did not heal well. One stump was edematous and the other developed gangrene. Therefore, about one month after the amputation surgery, a femoral periarterial sympathectomy was undertaken to encourage healing. Twenty-two days later good healing was evident.

There are two reasons why this operation may prove successful in such cases. The blood supply is needed in the more proximal part of the leg: healing is likely to occur within 5 weeks following the operation.

Tuberculous Meningitis in Children: A Preventable Illness

Dirk Verhoeff and Cyril Evans, NORTH CAROLINA M. J., 17:103-107, March 1956

A study of 2 white and 13 negro children admitted to the North Carolina Sanitorium with a diagnosis of tuberculous meningitis is presented. Diagnosis was made either prior to or at the time of admission, which was during the years 1953 and 1954. The age group ranged from 5 months to 10 years; 11 of the 15 being under 3 years of age.

Tubercle bacilli cultures obtained from spinal fluid and/or gastric washings formed the basis of the diagnosis. If the tubercle bacilli were not isolated in these tests, the results

from cerebrospinal fluid findings, the presence of pulmonary tuberculous lesions, positive tuberculin skin tests and clinical progress of the disease were used. Spinal fluid changes specific to tuberculous meningitis include increase in initial pressure and in the number of cells per cubic millimeter. Also, the protein content is elevated, and the sugar content is lowered. If the fluid is allowed to stand, an opalescent fibrin web may form.

Six case studies are presented for the main purpose of emphasizing the early recognition and treatment of the disease. The probability that tuberculous meningitis could have been prevented in at least 11 of these 15 children is discussed. Six of a group of 9, whose first symptoms were those of meningitis, had been in close contact with people in acute stages of tuberculosis.

Treatment advocated is now mainly that of isoniazid therapy, 8 to 10 mg. of this drug per kilogram of body weight given daily either orally or intramuscularly. Other drugs used concomitantly are: streptomycin, para-aminosalicylic acid and adrenal steroids.

Adduction Contracture of the Thumb

J. Edward Flynn, NEW ENGLAND J. MED., 254:677-686, April 12, 1956

Adduction contracture of the thumb presents a most serious disability of the hand. The hand is incapable of proper grasp, pinch, and stereognosis. The functional anatomy of the thumb is described in detail. No one muscle acts alone, and all motions are the result of coordinated action of all muscles. The motion in one joint usually requires fixation in appropriate position of the joints proximal to the one being moved. Whenever any muscle contracts there must be a reciprocal relaxation of its opponent. The individual thumb motions are then discussed.

Adduction deformity in its simplest form predicates fixation of the thumb in the position of adduction against the radial border or in front of the radial third of the palm of the hand. In general, the deformity will be such as to preclude opposition, apposition, adequate flexion of the index and long fingers, and maximal loss of effective function of the hand. The commonest causes of adduction contracture are burns, trauma, infection, ischemia, paralysis, spastic conditions, and improper splinting.

The main part of this paper then describes the surgery for this type of deformity, particularly when primary therapeutic measures have been neglected or ineffective. The surgery described includes z-plasty, full thickness or thick intermediate-thickness graft, division of the insertion of the adductor pollicis, excision of all contracting tissues, fusion of the carpometacarpal joint, pedicle graft, and tendon transfer. Several case reports which illustrate the various extents of adductor contractures, the different causes, and the various procedures are included with illustrations.

Peroneal Translocation for Paralysis of Plantar Flexor Muscles

E. C. Elkins, J. M. Janes, E. D. Henderson, and J. J. McLeod, SURG., GYNEC. AND OBST., 102:469-471, April 1956

Paralysis or marked weakness of the plantar flexors results in the following: (1) a limp because of inability to "toe-off", (2) inability to climb stairs or walk rapidly, and (3) a tendency toward severe talipes cavus and calcaneal deformities. This article discusses the translocation of the tendon of the peroneus longus to alleviate these disabilities. The advantages of translocation as compared to transplantation are listed. (1) Structures are displaced without disturbing their continuity. (2) Suture of a tendon is avoided. (3) The period of immobilization is shorter. (4) The muscle is immediately placed under tension, which prevents loss of strength.

The surgical procedure is described in detail. Briefly, the tendon of the peroneus longus is freed from its sheath. A groove is made on the posterior and plantar surfaces of the calcaneus. The position of the tendon is changed so that it lies in this groove. After completion of surgery a cast is applied with the foot in plantar flexion. At the end of 3 weeks physical therapy is started. This consists of whirlpool, deep sedative massage, stretching of the translocated tendon, reeducation exercise of the muscle in its new function of pure plantar flexion, and progressive resistive exercises to increase power.

Of the 34 operations reported on here, 94.2 per cent were followed either by improvement of deformity or by no further progression of it. It is stressed that the peroneus longus muscle must be normal or nearly so. It must possess the required power in its new position to enable the patient to stand on the affected foot with the heel raised from the floor. The available leverage is not great and the weight of the entire body is to be lifted. Also, any power which the gastrocnemius muscle can exert aids in the success of the procedure.

The Operative Treatment of Pectus Excavatum

Mark M. Ravitch, J. PEDIAT. 48:465-472, April 1956

Pectus excavatum is a congenital anomaly usually noted soon after birth and demonstrating a tendency toward progression. This deformity of the chest wall is characterized by a depression of the body of the sternum, thus causing a concavity possibly reaching as far back as the vertebral bodies. Bending backward of the lower costal cartilages toward the displaced sternum increases the breadth of the concavity. Maximal depth is usually noted just above the xiphisternal junction.

More severe cases of pectus excavatum, or funnel chest, may carry with it other deformities; a decreased anteroposterior diameter, a moderate dorsal kyphosis and a forward thrust of the head. Infants and children may feature an inward motion of the sternum and prominent protrusion of the abdomen upon inspiration. Displacement of the heart, to the left and rotation posteriorally, is another deformity—the degree of which is determined by the severity of the funnel chest.

Operative procedures to correct this condition are indicated for orthopedic, physiologic, and cosmetic purposes. These procedures should be undertaken at the earliest possible age. Thus deformities often appearing secondary to funnel chest may be avoided. Dyspnea, cardiac arrhythmias, exercise intolerance, and social embarrassment for the adolescent are strong indications for operation. Corrective exercises, without undertaking surgery, are not thought to be beneficial.

The technic of this operation is described in detail. Distorted cartilages are removed, the sternum is fixed in its proper position, and all other structures which may recreate the deformity are freed.

Fifty operations of this type have been performed on 43 children and 7 adults. Ages ranged from 3 months to 38 years. The single death in this group was caused by a massive and

immediate wound infection. Patients may have tachycardia and fever for a day, but are usually ambulatory on the second or third day. Postoperative reports have indicated the success of this operation and the increased vigor and energy of the patient.

The Rehabilitation of Crippled Children

Jayne Shover, HOSPITAL MANAGEMENT, 81:39-41, April 1956

This is one of a series of articles on Rehabilitation appearing in *Hospital Management*, April 1956. The author is Associate Director of the National Society for Crippled Children and Adults. She discusses the current trends and recent developments in the rehabilitation of crippled children.

Two decades ago the crippled child was treated as a medical problem only, with no particular plan for meeting his other needs. Frequently, he was isolated within the family group. He often found himself with little social or recreational life, without the ability to know or understand his nonhandicapped fellows, and with few experiences which would help him to adjust to the so-called "normal" world in which he would live as an adult.

Today, that picture is changing. The modern rehabilitation program stresses comprehensive planning. It may begin with medical diagnosis, hospitalization and surgery, but is followed by an after-care plan leading to the use of all the community facilities required to meet the child's needs. Parent education and information form an essential part of this plan. All resources are being marshalled to develop the potentialities of the crippled child with a view to making him a participating and vital force in his home and community.

The specific role of the hospital staff in this program is discussed. This includes surgical, medical and nursing care, nutritional needs, planned recreation programs, occupational therapy, educational planning, and social work planning with the family. The hospital staff is also concerned with the planning for the child at discharge. In most instances there is need for continuing a rehabilitation plan in the community after release from the hospital. This covers medical supervision, physical, occupational and speech therapy, special education, recreation, and for the older child, vocational guidance and training. The trend now is for all community agencies to join in the teamwork effort required to provide the best possible rehabilitation services for crippled children.

Value of a Yearly Physical Survey In the Adult Female

Robert N. Rutherford and A. Lawrence Banks, J.A.M.A., 160:1289-1292, April 14, 1956

A program of annual physical examinations has been developed on the basis of 5 years experience with 5,000 female patients. The desire on the part of the patients for the yearly check-up was outstanding. While the primary purpose was an attempt to detect early cancer, other coincidental medical problems were watched for. The patients were 20 to 55 years of age. Some had come in originally about obstetric or gynecologic problems and others had come just for a check-up.

The plan for the yearly check-up included many procedures. First, a careful history was taken. Here care was taken to detect changes in physiological patterns during the year. The physiological examination was rather complete with emphasis on the female organs, including taking a vaginal smear. Laboratory studies were carried out. The patient was also given instruction in a simple breast palpation examination, which she is to carry out monthly at home. In addition to the yearly check-up, she was encouraged to report immediately if she experienced unexplained pain, bleeding, or fatigue.

By careful screening, preinvasive or early cancer can best be detected at a time most favorable for treatment and/or cure. This program also enables the physician to catch other constitutional illness as well. It also emphasizes to the patient the desire of the physician to anticipate and to prevent problems. With improved methods of laboratory procedure the examination can become more valid and large scale procedures can reduce the cost per patient.

Clinical Investigations on Attenuated Strains of Poliomyelitis Virus

Hilary Koprowski, et al., J.A.M.A., 160:954-966, March 17, 1956

Since about 1950 research has demonstrated encouraging results in the attempt to immunize against poliomyelitis with live attenuated viruses. Further investigation of some of the problems connected with this procedure is undertaken in the present study.

Children from a state institution for mentally defective children were used. After obtaining needed permission, the children were isolated in a separate building. Strict isolation procedures were enforced. The children were all mentally deficient and the majority had a variety of chronic neurological diseases. One hundred and fifty nonimmune subjects received type 2 TN virus strain and 75 received type 1 SM strain. Laboratory studies included isolation of poliomyelitis virus from stools and neutralization tests.

During the entire period of study there was no acute disease with neurological manifestations. The clinical problems which arose were definitely related to the preexisting chronic abnormality or acute conditions such as the common cold and pharyngitis. All children developed poliomyelitis antibodies. The type 1 SM strain was excreted by every child and type 2 TN strain was rarely excreted.

After the preliminary study with the children isolated from each other, certain subjects were allowed to be in close contact with previously infected children. Transmission of the attenuated type 1 SM strain from infected child to exposed child occurred in 5 out of 15 contacts. Type 2 SN strain, however, was not transmitted, and therefore is demonstrated to be noncontagious.

In another procedure some children were fed virus simultaneous with an injection of immune serum globulin. In this study it was evident that the gamma globulin had no effect on the antibody response.

Heart Involvement in Progressive Muscular Dystrophy

Arthur A. Berenbaum and William Horowitz, AM. HEART J., 51:622-627, April 1956

The occurrence of cardiac involvement in progressive muscular dystrophy has recently come to be recognized as a fairly frequent sequel to the primary disorder. Previously, it was considered a rare complication of the underlying disease process. It has been estimated that the heart is involved in one form or another in about 50 per cent to 85

per cent of the cases, particularly of the childhood type. As muscular dystrophy is by no means a rare disease, this large proportion of cardio-vascular complications becomes an important problem.

Several recent reports link the cardiac manifestations in progressive muscular dystrophy to the primary myopathy. They suggest the term "dystrophic heart disease." The present authors report a case of progressive muscular dystrophy in which myocardial involvement was not suspected until the development of congestive heart failure. The patient promptly responded to treatment. However, the patient died suddenly five weeks later when the condition was apparently well controlled and the patient was ambulatory. The evidence in this case is highly in favor of myocardial involvement by the dystrophic process.

The clinical manifestations of progressive muscular dystrophy are discussed. Other cases of cardiac involvement by the dystrophic process are reported in literature. In one case the changes in the myocardium were much more striking than those in the skeletal muscle; in others, the lesions in the myocardium were identical with the lesions in the skeletal muscles.

Our Abstractors for August

Again we wish to express our appreciation for the assistance given the editors by Jean Cuthbertson and Judith Kurtz in the preparation of abstracts for this issue.

Book Reviews . . . . .

Human Physiology. *By F. R. Winton, M.D., D.Sc., Professor of Pharmacology, University College, London; and L. E. Bayliss, Ph.D., Honorary Research Associate in Physiology, University College, London. Fourth Edition. Cloth; price $8.00. Pp. 616; illus. Little, Brown & Co., Boston 1955.*

Since the first publication in 1930, this textbook has had a reprinting after each edition. The fourth edition has undergone extensive revision in an effort to present the current advances of a luxuriant expansion of knowledge in fundamental and applied physiology. The whole, or large parts, of nine chapters have been rewritten. Chapters on "Body Fluids" and "Transmission at Nerve Endings" have been made separate entities; while the chapters on "Metabolism and Energy Liberation" and the "Central Nervous System" were enlarged.

The illustrations, graphs and tables are numerous, clear and understandable and many of the new ones original. The bibliography at the end of the book is by no means complete. The authors intended it only as a guide for students wishing to penetrate more deeply into a specific branch of physiology. It contains many books and articles which represent the best available account of their field although not the whole of their content is up to date.

As in other physiology textbooks, this one does not seem to emphasize any one special area. The influence of exercise on the cardiovascular-respiratory and neuromuscular systems is discussed briefly. The aims of the authors to encourage the "intellectual attitude of an alert explorer" rather than allowing him to remain "the passive recipient of orthodox knowledge" prevails throughout this edition. Twelve colleagues, each well known in his own field, collaborated with the authors in the revision of this text on human physiology.

Recreation for the Handicapped. *By Valerie V. Hunt, R.P.T., Ed.D., University of California, Los Angeles. Cloth; price $6.65. Pp. 339; illus. Prentice-Hall Inc., New York, 1955.*

This is a reference book worthy of consideration by the recreational therapist, or the physical therapist who is faced with a situation in which he must make some attempt to fill the recreational needs of the patients under his care.

The purpose of the book, in the words of its author, is "not to review the existing philosophies of recreation or to comment on their adequacy or inadequacy, but to survey briefly the basic nature of man, his environment, and the interaction between them, with a view to determining what a need is and how recreation can satisfy a need."

Toward this end the author has organized the book into two parts, the first of which serves as a general orientation and introduction to the field of recreation. Here "the reader's attention is directed to the subtle biosocial interactions of the disabled and to how these increase, lessen, or change their recreational needs." Such a section is essential to the nature of the book but the subject is treated with such scientific abstraction and depth that the reviewer was sometimes at a loss to relate the discussion to the world of recreation and play. It would seem that a more simply written introductory section might be equally as valuable and would certainly assure the writer a wider audience. This would be particularly true among those therapists in allied fields who might find themselves thrust willy-nilly into the field of recreation because a need must be met. These last, should they leaf through only the first 50 or so pages of the book, would be discouraged from reading further. Nevertheless the book offers much of value for them.

Part II of the book deals with the more practical aspects of recreational activities for the handicapped. Separate chapters deal with the deaf, the blind, the diabetic, the orthopedically incapacitated, the neurologically incapacitated, the epileptic, the cardiac, the tubercular, the convalescent, the psychotic, the mentally defective, the mentally gifted, and the aged. Each chapter includes a brief introduction, an excellent section of background information concerning the emotional and intellectual characteristics of the particular handicap and the physical characteristics to be considered when planning a program of recreation. There is, further, a discussion of special needs and interests of each group, program planning, desirable equipment and facilities, and recommended activities. The two final chapters deal with Camping and Scouting, and the book concludes with seven pages of Selected References.

It is in this second portion of the book that one finds its real value. Here are found answers to some of the recreational problems arising in the homogenous handicapped group as well as in the group which may contain normals and persons handicapped in one or more of the defined areas. Here, too, the style is more cursive, clearer, and generally easier to read. The discussions of specific needs to be met, desirable equipment, leader approach, and methods of supervision are most helpful.

The book is recommended to physical therapists who may find themselves faced with the necessity of meeting at least a part of the recreational needs of groups of handicapped persons.

Industrial Recreation. A Guide to Its Organization and Administration. *By Jackson M. Anderson, Assistant Executive Secretary and Consultant in Recreation and Outdoor Education, American Association for Health, Physical Education and Recreation; Director of Research, National Industrial Recreation Association; formerly Associate Professor of Recreation, Purdue University, Indiana. Cloth; price $5.00. Pp. 304. McGraw-Hill Book Co., New York, 1955.*

This thoroughly written book is the first one on the subject of industrial recreation. Increasingly business and industry are establishing recreation programs for their workers. This movement has created a need for well qualified people prepared to accept positions of responsibility and leadership in directing and planning programs of employee recreation. Courses in industrial recreation are being offered in several colleges and universities now. This book is designed as a useful tool to be used by the people participating in these courses.

This volume should also serve as a practical guide to company recreation directors and other personnel administering employee recreation programs. However, it should serve not only as a guide, but also as a source of information for leaders in business and industry. It refers to the social implications for industrial recreation programs, and the impact of the need for recreation within the community as the result of twentieth century industrialization in America.

The entire book is based on valid and reliable information presented from the author's rich background and experience in recreation. It is authenticated by material based on the best accepted practices as revealed by research studies. This volume is divided into three parts. Part I. — Principles of Industrial Recreation — defines industrial recreation and presents benefits to be derived from employee recreation programs. It also gives the history of the growth and development of industrial recreation. There is a fine chapter concerned with recommended principles and policies for program planning and organization and administration. Part II. — The Industrial Program — discusses the planning and initiation of the program. Here the longest chapter in the book is written on program activities. It covers in a thorough and carefully thought out fashion information about those activities which have proved most popular in employee recreation programs. It points out some of the important factors in the selection and promotion of these activities. Part III. — Administration of Industrial Recreation — is an excellent presentation of all the factors which contribute to successful administration. The fundamentals of effective administration including the need for qualified and effectual leadership, planned program operational essentials, sound financing, physical plant, records and reports, publicity and public relations, and others are well described. This part of the book may be recommended as profitable reading for anyone entrusted with the responsibilities of administration.

This book should serve as a textbook for courses dealing with the organization and administration of industrial recreation. It should serve as a source book for business and industrial leaders. It is a book of interest to physical therapists because it describes an area which when well met may decrease their case load of disability arising primarily from psychological and psychosomatic factors, and leave more time for the treatment of disability resulting from pathology.

Medical and Psychological Teamwork in the Care of the Chronically Ill. *Edited by M. R. Harrower. Cloth; price $5.75. Pp. 244. Charles C. Thomas, Springfield, Illinois, 1955*

This is a report of the discussions of a conference group of internists, psychiatrists, and clinical psychologists. After their section leaders had done extensive planning, they met together for three days to find: 1) ways and means of using more effectively rehabilitation, administration, and state agency facilities for the chronically ill; 2) solutions to the problems of training and utilization of clinical psychologists; 3) an approach to research problems involving the physician and the psychologist.

From consideration of the first topic evolved a not new but well crystallized point that the chronically ill may be mentally, physically, socially, occupationally or nutritionally unfit, or any combination of these — in many cases the unfitness functioning as an escape mechanism for the patient. The other point strongly emphasized was that the teamwork required for effective care of the patients must be backed by heart and mind as well as lip service at appropriate moments. All too often "the team" is on paper, while its members are chiefly concerned with establishing recognition among themselves.

In regard to revision of the training of clinical psychologists so that they can better help the chronically ill, a new concept was presented which, it was felt, might in a generation or two remove much of the overload presently placed on psychiatrists. In essence it consists of training clinical psychologists to do psychotherapy without immediate supervision from psychiatrists. Its acknowledged weakness would be that the lay therapist would not be able to determine or treat intercurrent organic disease; hence, effective liaison with a physician would be mandatory under lay psychotherapy licensure.

The research study reports emphasized the need for increased information on the tie-in between personality and disease. It was felt that a good starting point might be the accumulation of verbatim records of physician-patient conversation, with a psychologist analyzing the records for ways of improving physician approach and for indications of patient personality imbalance.

This book will be of value to those in the medical and allied professions who work on the administrative level, and will help them to develop more efficient and effective teamwork in the care of the chronically ill.

The reviews here published have been prepared by competent authorities and do not represent the opinions of the American Physical Therapy Association.

Our Book Reviewers for August

James E. Griffin, Associate in Physical Therapy, University of Pennsylvania, Philadelphia.

Sara Jane Houtz, Research and Educational Consultant, Detroit Orthopaedic Clinic, Detroit.

Adelaide L. McGarrett, Professor of Physical Therapy; Physical Therapy Director, Boston University, Sargent College of Physical Education, Cambridge.

Miriam L. Rodenberger, Major USAF (MSpC), Officer-in-Charge Physical Therapy, 3201st USAF Hospital, Eglin Air Force Base, Florida.

What's New . . . . . .

For more information on items write to The Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

New items which may be of interest to physical therapists will be mentioned in these pages each month. The accompanying explanations are made by the manufacturers and have not been investigated by the *Physical Therapy Review*.

150. Variable/Intermittent Traction Machine

Simplified lightweight unit includes all facilities necessary for administration of both vertical and horizontal cyclic traction. Levinthal Varitrak quickly mounts on wall bracket or foldaway table bracket.

The manufacturer states that, operating at 3 cycles per minute, the machine has adjustments to give any range of force up to 50 pounds. Controls are arranged so that if desired the patient can start and stop the cycle at will.

A full line of accessories is available including halters, belts, and crossbars for cervical, pelvic, and leg traction as well as for installation of the machine on hospital beds. Levinthal Electronic Products, Inc.

151. Seat Unit

Alternating pressure-point unit fits any chair. It operates on same principle as alternating pads for bedridden patients.

Electric motor drives air pump which inflates and deflates alternate rows of air cells on four-minute cycle. Seat pad prevents pressure sores by massaging pressure areas of buttocks as pad cells inflate and deflate automatically, manufacturer states. R. D. Grant Co.

152. Enamel-Ceramic Kiln

Duo-Kiln can be used for enameling, ceramics, and even porcelain decoration. It sells for only $29.95. Among the features are an 8" x 9" x 4½" firing chamber, a 3 heat, 15 amp. U. L. approved switch, U. L. approved cord and accessory pyrometer.

The Duo-Kiln cabinet is welded-steel finished with a heat-resistant metal coating. It's plug-type door has a peep hole and heavy-duty piano-style hinge.

Firing temperature range is up to 2050° and heating time to 1500° is 45 to 55 minutes. The Copper Shop.

Classified WANT-ADS

WORK IN TORRANCE, CALIFORNIA, near Los Angeles and beach resorts. Several openings for physical therapists at Los Angeles County Harbor General Hospital. Must be graduate of approved school. Good salary, civil service benefits. Promotional opportunities. Write: Personnel Director, Harbor General Hospital, 1124 W. Carson Street, Torrance, California.

QUALIFIED PHYSICAL THERAPIST—Well established PM & R unit serving 312-bed general hospital. New England college town. Liberal personnel policies. Good starting salary. Semiannual reviews. Living quarters optional. Laundry furnished. Write Mr. George Stoddard, Personnel Director, Mary Hitchcock Memorial Hospital, Hanover, New Hampshire.

POSITIONS AVAILABLE for qualified physical therapists for active rehabilitation department in modern 500-bed, chronic disease hospital. Salary open. Four weeks' vacation. Sick benefits. Lunches. Apply Superintendent, St. Barnabas Hospital, New York 57, N. Y.

PHYSICAL THERAPIST: STAFF position. Opportunity for varied experience; 650-bed general hospital, near center of cultural and educational activities. Vacation, sick leave, and social security benefits. Apply Personnel Director, Harper Hospital, Detroit, Michigan.

WANTED: QUALIFIED physical therapist experienced in REHABILITATION technics to treat and instruct patients in arthritis clinics of metropolitan hospitals with some home follow-ups. Must drive car. Excellent opportunity. Apply Arthritis & Rheumatism Foundation, John Bartram Hotel, Philadelphia 7, Pa.

WANTED: PHYSICAL THERAPIST (female) for full or part-time work in orthopedic surgeon's office. Write to Daniel B. Eck, 144 South Harrison Street, East Orange, N. J.

REHABILITATION SERVICES, INC., 200 Court Street, Binghamton, New York, will have staff physical therapist position available September 3, 1956. Modern facilities, outpatient service, established personnel policies, with salary dependent on qualifications. Inquire: Ward A. Merrell, Administrator, Rehabilitation Services, Inc.

PHYSICAL THERAPIST wanted for doctor's office, new department. Located in community of fifty thousand. Good salary. Apply to Drs. Lebold and Anderson, 1489 State St., Salem, Oregon.

SUNNY SOUTHERN CALIFORNIA County Hospital has a vacancy for a Physical Therapist. Fully equipped department, paid vacations, sick leave, Health Insurance plan, and retirement program. Starting salary $343, increases to $417. Excellent nearby desert, mountain and sea shore recreational facilities. Write San Bernardino County Civil Service and Personnel Department, 236 Third Street, San Bernardino, California.

PHYSICAL THERAPIST: Staff position with varied duties; 398-bed acute general hospital with expansion program underway. Opportunity for advancement in planned rehabilitation unit. Liberal personnel policies. Address replies to Box 18, care of the Physical Therapy Review, New York 19, New York.

PHYSICAL THERAPISTS WANTED: Easter Seal Center, Kankakee, Illinois; Ottawa, Illinois; Aurora, Illinois. Excellent salaries. Contact Elizabeth L. Jameson, Program Consultant, Illinois Association for Crippled, 2325 So. 11th Ave. Broadview, Illinois.

WANTED: QUALIFIED PHYSICAL THERAPISTS for rapidly expanding physical medicine and rehabilitation department. Write: Department of Rehabilitation, Cedars of Lebanon Hospital, 4833 Fountain Avenue, Los Angeles 29, California.

NEEDED IMMEDIATELY Physical therapist to organize a Home Service Program. Outpatient Physical Medicine Rehabilitation Center in University and capitol city. Excellent personnel policies. Write: Gloria J. Fitzpatrick, R.P.T., Director, Ingham County Curative Workshop, 615 N. Capitol, Lansing, Michigan.

PHYSICAL THERAPIST for well equipped C. P. Center; 10 month program. Salary commensurate with training and experience. Apply to Director, C. P. Training Center, 901-24th St., Newport News, Virginia.

PHYSICAL THERAPIST: In Hospital-School for rehabilitation of children with orthopedic handicaps. Complete interesting program. Good salary, merit increases. Annual paid vacation, sick leave, excellent retirement plan. Write Vera E. Dennis, Director of Physical Therapy, Illinois Children's Hospital-School, 2551 N. Clark, Chicago 14, Ill.

ORTHOPEDIC CLINIC with three surgeons needs a qualified physical therapist to work in two-therapist department. Salary dependent upon experience. Write: Mrs. Margaret Steele Smith, R.P.T., Knight, Ware and Sutherland Clinic, 2618 Welborn Street, Dallas, Texas.

QUALIFIED physical therapist for SUPERVISORY position. Salary open. Write Personnel Director, University of Nebraska, College of Medicine, 4215 Emile Street, Omaha, Nebraska.

PHYSICAL THERAPIST for 500-bed general hospital. All types of cases—mostly acute, short term. However, no polio or C. P. Recent graduate acceptable. Inquire: Akron General Hospital, Akron, Ohio.

WANTED IMMEDIATELY: TWO qualified physical therapists for staff positions in 565-bed general hospital. Good salary with regular increases, vacation holidays and sick leave; 40-hour week; laundry and meals provided. Write: Mr. Doff Griffith, Physical Therapy Dept., Akron City Hospital, Akron, Ohio.

ASSISTANT CHIEF PHYSICAL THERAPIST to supervise technical activities of large qualified staff; extensive variety of clinic and hospital cases; opportunity for research; 4 weeks annual vacation, disability leave, retirement system; knowledge of electromyography desirable but not necessary; AND QUALIFIED STAFF PHYSICAL THERAPIST: Interesting & progressive department with wide variety of clinic and hospital cases; opportunity for research; 5-day week; annual leave with pay, disability leave, retirement system; salary commensurate with experience and/or specialized training. Apply Office of Non-Academic Personnel, or Dept. of Phys. Med. & Rehab., 840 S. Wood St., Chicago 12, Ill.

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Classified WANT-ADS

IOWA'S LARGEST PRIVATE HOSPITAL now planning expansion of facilities needs qualified physical therapist. Institution includes 100-bed Raymond Blank Memorial Hospital for Children. Post-polio cases, in-and outpatient work. Competent professional staff and assistants, excellent working relationships. Apply Anthony D. Damiani, Personnel Director, Iowa Methodist Hospital, Des Moines, Iowa.

PHYSICAL THERAPIST WANTED to share equal responsibility with present therapist in orthopedic school. All types of disabilities. Community cerebral palsy program centered in school with trained medical consultant holding cerebral palsy clinics once a month. New million dollar orthopedic school now under construction. For complete details write: Donald F. Toffe, Principal, 815 DeKoven Avenue, Racine, Wisconsin.

QUALIFIED PHYSICAL THERAPIST: immediate opening, newly equipped department, treat polio orthopedic and neuromuscular patients; 40-hour week; congenial working conditions; starting salary $66.80 per week; 15 paid sick days, 10 paid holidays, and 2 weeks' vacation per year; excellent retirement plan; write or apply to Personnel Department, City Hospital, Worcester, Massachusetts.

QUALIFIED PHYSICAL THERAPISTS for immediate placement in established Crippled Children's Hospital and rapidly growing comprehensive Rehabilitation Center treating wide variety of patients. Well equipped therapy department with pools and adequate space. Employee benefits. Maintenance if desired. Write: Jack E. Pearson, Morris Memorial Hospital and Rehabilitation Center, Milton, West Virginia.

PHYSICAL THERAPIST for 190-bed hospital to assist present therapist. Volume of work increasing. Department well equipped. Hospital in city of 40,000 population located on St. Clair River and lower Lake Huron. Write: L. R. Faust, Administrator, Port Huron Hospital, Port Huron, Michigan.

A STAFF PHYSICAL THERAPIST for rapidly expanding rehabilitation center, either experienced or inexperienced therapist acceptable. Excellent working conditions, 37½ hour work week, good pay, good personnel policies, good medical supervision. Wonderful opportunity for staff growth and promotion. Crossroads Rehabilitation Center. Contact Roy E. Patton, Executive Director, 3242 Sutherland Avenue, Indianapolis, Indiana.

WANTED MALE PHYSICAL THERAPIST, qualified to work with cerebral palsied children. Starting salary $350 mo. Spastic Children's Foundation, 1307 W. 105th St., Los Angeles 44, Calif.

PHYSICAL THERAPIST: for active well equipped department in large teaching center affiliated with Washington University. Good salary with regular increases and paid vacation. Write to Mrs. Ruth Benz, Dept. of Physical Therapy, 600 South Kingshighway, St. Louis 10, Missouri.

QUALIFIED PHYSICAL THERAPIST to head new department in seventeen-physician clinic. Good salary; 42-hour week; liberal vacation, holiday, sick leave plan; free medical care and hospitalization; pension plan. Write: R. B. Schmierer, Clinic Manager, Dakota Clinic, 702 First Ave. South, Fargo, North Dakota.

Classified WANT-ADS

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